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# TOWNSEND

## COMMUNITY DEVELOPMENT PROGRAM

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# PHASE I REPORT

A study prepared for the  
TOWNSEND COMMUNITY DEVELOPMENT PROGRAM  
Ministry of Housing



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March 1976

"THIS REPORT WAS PREPARED AS BACKGROUND MATERIAL IN THE PLANNING OF THE TOWNSEND COMMUNITY DEVELOPMENT PROGRAM PLANNING AREA, AND DOES NOT NECESSARILY CONSTITUTE A RECOMMENDATION OF THE MINISTRY OF HOUSING NOR APPROVAL OF THE GOVERNMENT OF ONTARIO".

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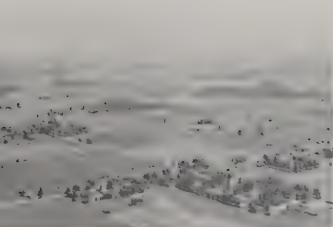


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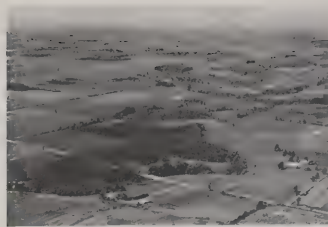




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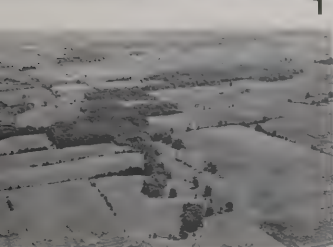
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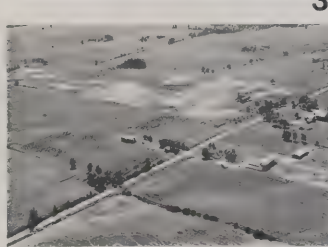
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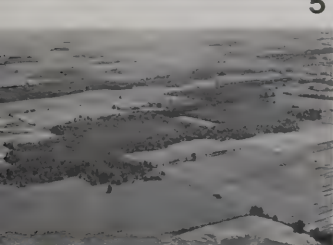
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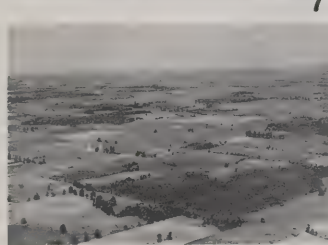
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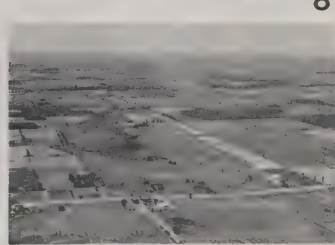
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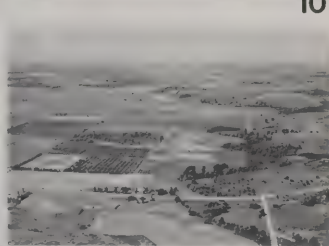
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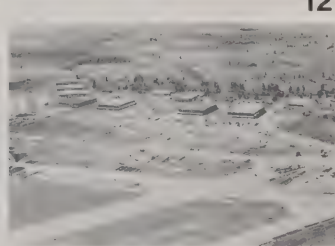
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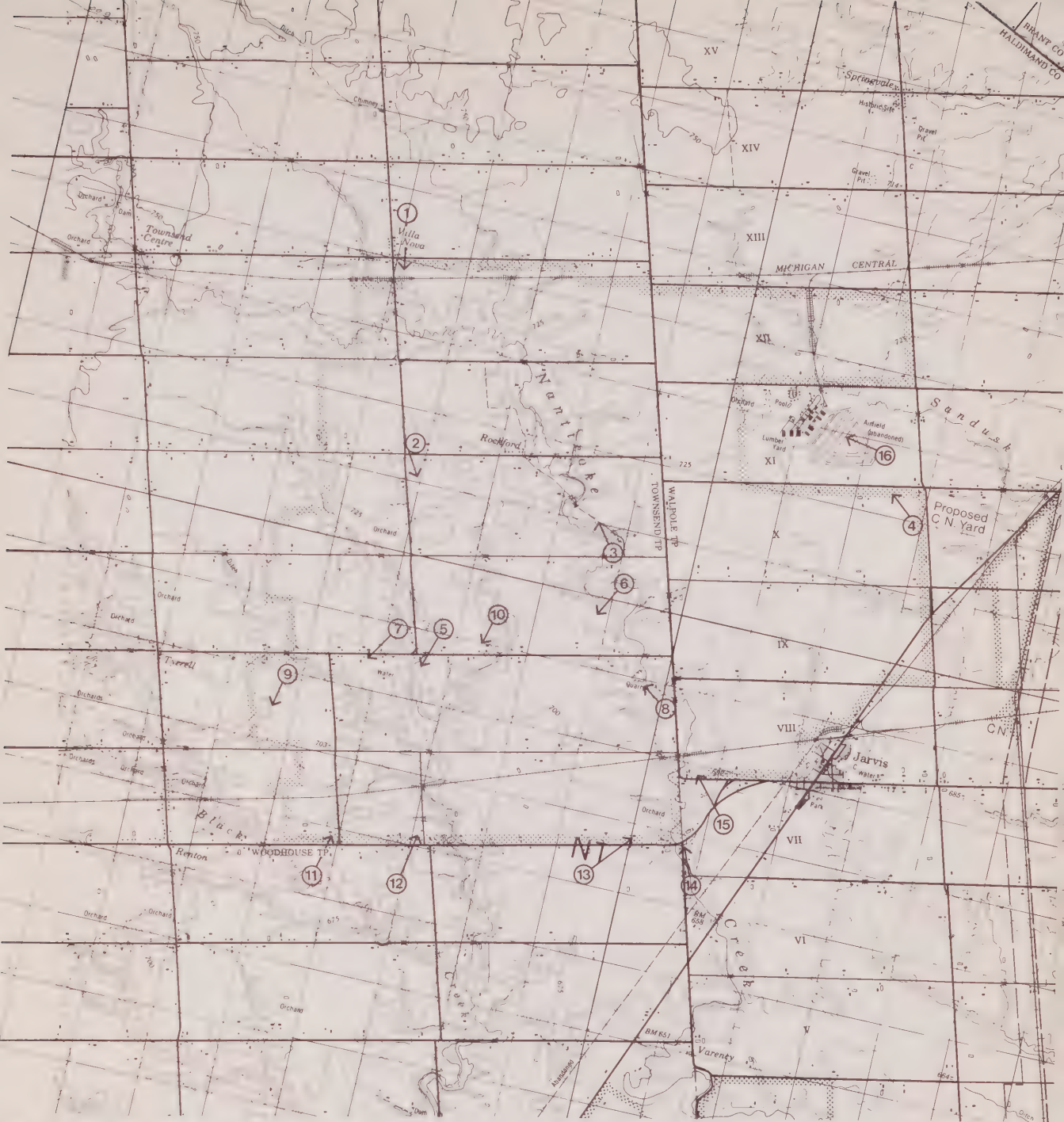


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## Overview of Site

② Photo Views



1KM  
1MI



Date April 76

# TOWNSEND

COMMUNITY DEVELOPMENT PROGRAM



## INTRODUCTION AND BACKGROUND

### 1:00 STUDY FRAMEWORK

This report represents the conclusion of the first three months of a planning study, which is to prepare a development plan and program for the new community of Townsend.

This introductory section presents the consultants current understanding of the status of the study, first by reviewing the fundamental agreements that have been reached concerning the role of Townsend and the requirements of the study, and secondly, by noting how the work completed to date fits into the overall work program. It also outlines the structure and purpose of this report.

#### 1.10 Terms of Reference for the Study

This planning study is to prepare specifically the following two physical plans:

- 1) An overall plan for the entire community.
- 2) A detailed plan for the first stage of the community.

The latter is to be in sufficient detail so that the required approvals can be obtained on completion of the study, and work can commence towards occupancy of the first houses on site in 1978.

Since commencing the study, agreement has been reached on several key policy issues between the

provincial and regional agencies. These policies, which are now assumed to be a firm decision for the purpose of this planning study, are the following:

- 1) Townsend is to absorb the major share of the regional growth over the long term, and as a result, will become the largest urban area in the Haldimand-Norfolk Region.
- 2) The plan for Townsend must be capable of accommodating 100,000 people in total, and approximately 70,000-80,000 by 2001.
- 3) Townsend will provide the main administrative and commercial centre for the Region.
- 4) During early regional growth, up to 1981 approximately, existing communities will be encouraged to grow at higher than previous rates in accordance with the "Interim Guidelines" of Regional Council, sharing growth pressures with Townsend.
- 5) The planning program must allow for Townsend to be capable of accommodating up to 7,000 people by 1981.

One of the key conclusions to be reached by this time in the study concerns the location of the urban development within the total site. Development envelopes for the final community of 100,000 and for a first phase of 20,000 have been recommended. (See figures 5.30 and 5.40.) As these have been already reviewed by the relevant provincial and regional agencies as well as the public, it is also assumed that these envelopes represent an agreed working basis for the ongoing planning work.

Consistent with these policies, a number of short-term population targets also have been given as guidelines in preparing the plan. These targets, which emphasize the rapid build-up expected in Townsend, are still considered subject to review.

As noted previously, a detailed plan is needed for the "first stage". This "first stage" now has been assumed to refer to a neighbourhood housing area for approximately 5,000 people, together with the appropriate supporting facilities. In addition, this plan will incorporate whatever regional facilities may be required at the time.



The increased concern being expressed about the loss of good agricultural land to urban development has caused a shift in the environmental resources of the study. While the new community inevitably must take agricultural land, the plan will be located, laid out and phased in a way to minimize the unnecessary adverse impact on the remaining agricultural area. In addition, general planning proposals and policies will be developed towards ensuring that viable farm operations can be retained in perpetuity on the undeveloped balance of the site, and in the short-term in those areas not immediately needed. The responsibility of the study, however, is still to prepare plans and programs for urban development.

#### 1.20 Outline of the Work Program

The preparation of the development plan and program for Townsend started in January 1976 and will be completed at the end of March 1977.

The most crucial aspect of the study affecting the work program is the need to prepare for first houses to be completed on the site in 1978. This has meant that the overall plan for the entire community must be developed concurrently with the detailed subdivision plan needed for the first development. Normally, one planning process follows the other as the area is examined systematically in increasing detail.

The overlapping of the two planning processes has had two consequences for the study. First, a number of fundamental decisions and recommendations must be made in the opening months of the study concerning the location, role and timing of Townsend. These are summarized in this report. Secondly, in order that the development will commence successfully, time must be devoted in the last months of the study to examining the ongoing management and implementation issues.

The work program has been divided into three phases, the first lasting three months and the latter two six months each. (See Appendix A.)

Phase I (January-March 1976) is now complete. The main objectives of this period were to agree the policies previously noted, determine the development envelopes, and prepare preliminary planning concepts. These and other results are reviewed in this report. (See section 1.30.)

In Phase II (April-September 1976) the work will focus on preparing the recommended plan for the total community of 100,000 population, and a more detailed plan for the first community of 20,000. (See Appendix B.)

Phase III (October 1976-March 1977) will be used primarily to prepare the subdivision plan for the "first stage" and any regional facilities required at that time, recommendations for the management and implementation of the plan, and a final report summarizing the proposals.

#### 1.30 Structure of Phase I Report

This first report has been written to serve a number of purposes:

- 1) To document the agreements reached to date on the critical policies affecting the planning of Townsend.
- 2) To highlight the main results of the work completed in Phase I.
- 3) To present preliminary conclusions on a number of outstanding planning and implementation issues.
- 4) To set out a general framework as well as a detailed work program for Phase II.

The base data on the Region and the site assembled to date, and various technical analyses completed, are summarized in sections 2:00 and 3:00. These only review those major factors that will influence the development of the plan; reference should be given to the supporting background papers for a complete review. (See Appendix E for a list of the papers.)

In addition to the data collection, this initial period also has been used to identify the outstanding planning issues that will affect either the plan or its subsequent implementation. One of the most important of these issues, the regional centre, is reviewed in section 4.00, together with the preliminary conclusions of the consultants and the approaches to be explored in Phase II.

One of the key objectives of Phase I also has been to select the potential short-term and long-term development envelopes for the community. The recommended envelopes are presented in section 5:00 together with a summary of the selection process.

Unless directed otherwise, the consultants will be proceeding immediately into Phase II of the study on the basis of the conclusions and recommendations put forward in this interim report.





## INTRODUCTION AND BACKGROUND

### 2:00 REGIONAL CONTEXT

Townsend is in the Regional Municipality of Haldimand-Norfolk. (See figure 2.10.) The area is now predominantly rural in character, but is expected to accommodate rapid growth for the next 25 years or more due to the major industrial development at Nanticoke.

This section reviews the current projections of population and employment growth resulting from the industrial development, and the current status of the housing market and the transportation and services infrastructure.

#### 2.10 Employment

The substantial growth in the Region is being generated by the major developments in the Nanticoke industrial area, which include a major steel plant by Steel Company of Canada Ltd. (Stelco), an industrial park for related spin-off industries also by Stelco, a new petroleum refinery for Texaco and a thermal generating station by Hydro.

The regional employment in 1971 was approximately 37,000. Within this, 16,800 was in the service sector, 10,300 in agriculture, 6,600 in manufacturing and 2,900 in construction.

The total employment generated by the Nanticoke industrial area is expected to amount to over 8,000 by 1986, and nearly 37,000 by 2001. (See table 2.10.)

Table 2.10:  
Total Employment Growth Arising from the Nanticoke Industrial Area (1976-2001)

Year	Employment by Industry						Total Employment	
	Stelco <sup>1</sup> Mill	Texaco <sup>2</sup>	Hydro <sup>2</sup>	Industrial <sup>3</sup> Park	Industrial Construction	Services	Cumu- lative	Annual
1976	30	30	470	-	1,260	245	2,035	2,035
1977	100	150	470	50	2,650	655	4,075	2,040
1978	745	275	470	150	3,400	1,250	6,290	2,215
1979	1,705	275	470	350	2,540	2,060	7,400	1,110
1980	2,600	275	470	500	2,550	2,850	9,245	1,845
1981	2,800	275	460	700	2,550	3,410	10,195	950
1986	5,000	275	460	2,700	2,600	9,985	21,020	2,165 <sup>4</sup>
1991	7,000	275	460	4,700	2,000	12,000	26,435	1,085 <sup>4</sup>
1996	9,200	275	460	6,700	1,800	16,000	34,435	1,600 <sup>4</sup>
2001	11,200	275	460	7,000	1,800	18,000	38,735	860 <sup>4</sup>

Notes:

1 As provided by Stelco in January 1976. These include maintenance personnel. Past 1986, the figures are rough estimates provided by Stelco.

2 From IBI Housing Policy Study and confirmed by the industry.

3 As provided by Stelco. (See text for the basis.)

4 Average annual employment intake for five-year period.



# Planning Context

- Employment Areas
- Greenbelt
- Indian Reservation
- Existing Towns
- Highways
- Railways



Date March 76

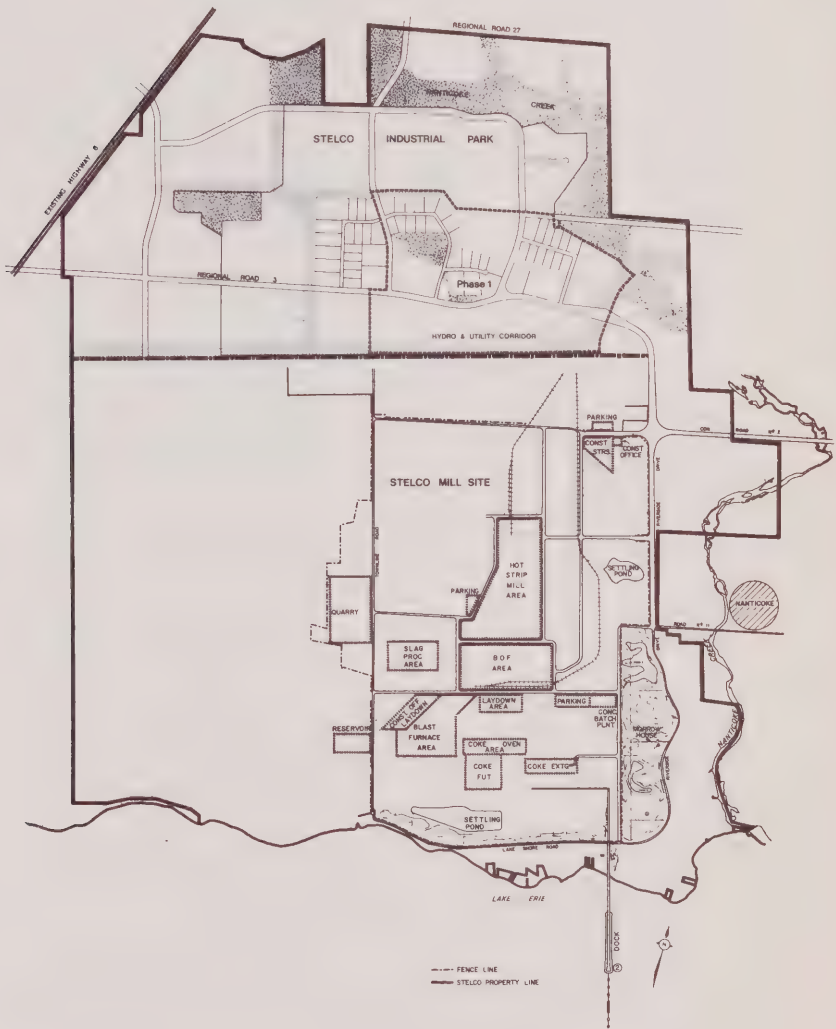
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The growth of new employment from the expansion of existing industries currently in the area is expected to be relatively small.

Stelco



2.11 Stelco Mill Site and Industrial Park  
(Scale = 1:50,000)

The Stelco steel plant will be the largest single employer in the area, with an associated 5,000 jobs expected by 1986 and 11,200 in 2001.

Construction is well underway on all of the major facilities in the first of four stages of the plant. These include a raw materials dock into Lake Erie, a coke oven battery, a blast furnace, a basic oxygen furnace with a continuous slab-casting machine, and a hot strip mill. The steel plant will cover about 1,450 ha when completed.

A construction slowdown of the plant was announced last year because of the slump in the steel market. The start-up of the plant is now expected in 1978 rather than late 1977 as originally planned. The second phase is scheduled for the early 1980s. Despite the slowdown, the capital investment to date has been too heavy to reasonably allow for abandonment of the project.

This slowdown has reduced the employment estimates for Stelco in the early years, but has not affected those for the long-term. The employment estimates shown for 1986 and beyond are the best estimates by Stelco to date; these are very much dependent on the timing of subsequent phases of the Stelco plant.

#### Texaco and Hydro

Although Texaco and Hydro are major capital-intensive industries, their total employment is relatively small, with a permanent workforce of only 275 and 460 at each respectively.

The Texaco refinery, which is being constructed to schedule, is expected to start up in late July of 1977 and have a full staff in 1978.

The Hydro generating station is presently operating at 75% of full capacity and now is fully staffed.

Because both will be completed before Townsend starts, neither are expected to influence the housing market in the new community.

#### Industrial Park

The industrial park planned by Stelco will contain an estimated 2,700 jobs by 1986 and 7,000 by 2001. It will be developed on 1,000 ha north

of the Stelco mill site. Of this, about 740 ha will be used for industrial and commercial purposes, and roughly 140 ha will be set aside for environmental conservation. The remainder will be required for utility corridors and services.

Stelco's slowdown also has dampened the growth of the industrial park. Stelco presently forecasts an annual absorption rate of 20 ha in 1977-1981, or 100 workers/year; and 30 ha in 1981-2001, or 450 workers/year. These figures are less than the prior projection of 40 ha/year.

The first phase of the area, covering about 130 ha, should be open for development in 1978. The first use expected is an oxygen plant to serve the steel plant. According to a Stelco spokesman, 18-20 firms are committed and a similar number have expressed interest.

#### Industrial Construction

The industrial construction workforce could amount to roughly 2,000-3,000 for 1977-2001. The workforce is primarily for Stelco, as Hydro and Texaco will be complete after 1977. The slowdown by Stelco has also affected these projections. As now anticipated, the construction employees will not peak as highly as previously announced, and the demand will be spread over a longer time period.

#### Service Employment

Service employment in the Region is expected to grow in support of the new population coming to the Region. This section could contain near 10,000 new jobs by 1986, and 18,000 by 2001. This initial projection is based upon other communities, where generally 8 service jobs are needed for every 10 industrial jobs. The growth in the services sector, however, can be expected to lag behind the industrial employment build-up.

These employment projections incorporate the residential construction workforce.

## 2.20 Population

The Regional Municipality of Haldimand-Norfolk in 1974 contained a population of about 84,000. The projected population for 1986 is approximately 130,000; and 200,000 for 2001. Some 40,000 of this growth to 1986, and 80,000 to 2001, is expected to result from the new employment at Nanticoke. The following section deals solely with the latter employment-induced population growth. (See table 2.20.)

The population projections resulting from the new industrial development and related spin-off industries are based upon demographic data and intake rates supplied by the various industries, and allow for the number of commuters, women in the workforce and local graduates from within the Region.

Commuting is expected to be high, especially in the early years of the industrial expansion, due to the good accessibility of the area from the residential areas in Hamilton and Brantford. 5-10% of the workforce is expected permanently to commute, except for the early workers at the industrial park, where the figure is 33% up to 1981. 75% of the industrial and residential construction workers are also expected to commute.

The proportion of women in the workforce will vary according to job category. They are expected to occupy 40% of the service jobs, 20% in the industrial park, 25% of the salaried jobs and 10% of the bargaining force at Stelco, 5% at Hydro, and none of the Texaco or construction jobs.

About 15% of the local male population entering the workforce in the 20-24 age group now leave the Region to seek employment or continue education elsewhere. Of those who remain, under 7% are not able to find employment. With the further job opportunities from new industry, approximately 10% more, or about 60 males annually, might choose to remain and find work in the Region.

The population moving to the Region and to Townsend by 2001 will have the following characteristics:

- 1) Nearly 40% of the employed population living in Townsend will work for Stelco, and another 40% will work in service industries.

- 2) Over 70% of the heads of households first moving to Townsend will be between the ages of 25 and 44.
- 3) Nearly 45% of the household heads will earn \$10,000-15,000 (1975 constant dollars) annually.
- 4) New households when first moving to the Region will have an average of 3.54 persons/household in the early years and 3.42 in the later years.

Table 2.20:

Population Projections for Haldimand-Norfolk  
Resulting Solely from the New Employment at  
Nanticoke (1977-2001)

Year	Household Growth		Population Growth	
	Annual	Cumulative	Annual	Cumulative
1977	860	860	3,005	3,005
1978	936	1,796	3,993	6,998
1979	1,274	3,070	4,440	11,438
1980	1,100	4,170	3,815	15,253
1981	540 <sup>1</sup>	4,710	1,884	17,137
1982- 1986	1,300 <sup>2</sup>	11,210	4,430 <sup>2</sup>	39,290
1987- 2001	800 <sup>2</sup>	23,210	2,740 <sup>2</sup>	80,402

Notes:

1 This figure is low because it occurs during the changeover from construction staff to permanent staff. It is just beyond the five-year planning horizon, and Stelco's estimates are not firm at this time.

2 Average annual growth.



### 2.30 Housing

The regional housing market at the current time can best be described as being in a state of flux.

Major developers have purchased or have options on land surrounding most of the existing towns in anticipation of a large demand due to industrial expansion, but the ability of these communities to expand is constrained by lack of services and existing local planning policies. Their combined growth is limited to about 2,900 units without further servicing upgrading, and about 9,000 units given local improvements presently planned. The Regional Municipality's "Interim Guidelines" on growth and, eventually, the Regional Official Plan will allocate the distribution of population in the existing urban communities.

Many lot severances on farms over the past ten years have been granted in the rural areas of Haldimand-Norfolk. Although no exact count is available, a very substantial number of lots could be developed, presenting a challenge to the implementation of regional planning policies.

The shoreline along Lake Erie has approximately 4,600 summer cottages in regular use. Some of these cottages have already been converted to permanent dwellings. The rate of conversions shows that the demand for housing in the Region is acute. Although the area is currently under Ministerial orders, these conversions have not been effectively controlled.

The summer cottages and rural severances represent a potential problem in dealing with the supply of housing in the early years unless development policies and controls are able to contain the situation effectively. It should be noted that the implications do go wider than Townsend because such scattered development will affect the provision of social and physical services by the Region.

## 2.40 Transportation

### 2.41 Road System

Highways 3, 6 and 24, which are part of the provincial network, are the most important existing roads in the vicinity of Townsend. (See figure 2.41a.)

The future status of these roads has been examined in the Niagara-Lake Erie Transportation Study (NLETS), conducted by the Ministry of Transportation and Communications (MTC). (See figure 2.41b.) The final report is now being completed.

#### Highway 3

Highway 3, the two-lane arterial along the southern boundary of the site, is the only continuous east-west route through the Region. It carries one-quarter of the long-distance traffic between the Niagara Peninsula and southwestern Ontario, and a large part of the truck and tourist traffic between Buffalo and Detroit. It also provides access to the numerous small towns on the north shore of Lake Erie.

Highway 3 will increase in importance as the Region grows. The Haldimand-Norfolk Study (1972) recommended total realignment of the road and improvement to freeway standard through the Region, but this was made when the regional population projections were significantly higher. The present policy of MTC is to maintain adequate service on Highway 3 by reconstruction and operational improvements as necessary, but not to decide on its future until the new developments in the Region have been planned sufficiently to indicate the long-term traffic demands.

#### Highway 24

Highway 24 passes west of the site, through Simcoe to Brantford.

According to NLETS, Highway 24 will be linked to the proposed Highway 403 near Brantford. Otherwise, it will remain a two-lane highway with improvements undertaken as required by traffic demands.

## Highway 6

Highway 6, immediately to the east of the site, is the most important north-south route in the Region. This two-lane highway links the Nanticoke industrial area with the Hamilton and Toronto metropolitan areas.

NLETS identified the need for improved transportation between Nanticoke and Hamilton due to the major developments in the area. Subsequently, the MTC initiated a Highway 6 Corridor Study to determine the traffic requirements of the route, and to select a joint highway-utility corridor incorporating the rights-of-way for the other linear services to Nanticoke.

This study has "endorsed" a new route for Highway 6 from just north of Caledonia to Jarvis. (See figure 2.41c.) The route basically swings west of Caledonia, crosses over the present route of Highway 6, and then follows along the eastern side of the Ontario Hydro right-of-way to Highway 3. The alignment north of Caledonia is still undecided pending the completion of other planning studies.

The highway right-of-way planned is 107 m wide. The existing hydro corridor takes 300 m, and a buffer strip of 50 m is to be reserved between them for unknown long-term uses. The Inter-provincial and Trans Northern Pipelines will locate their services in the Hydro right-of-way, while Bell Canada has decided not to follow the corridor because of possible interference.

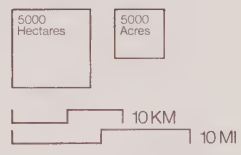
Because of financial restraints, Highway 6 must be built in sections. Construction of the Caledonia bypass will start in one-three years, and the other sections as traffic warrants. MTC presently consider the bypass of Hagersville will not be built for at least five years, and the section east of Townsend for at least 10 years. Only the land needed for the Caledonia bypass will be purchased in the next few years.

Four alternative alignments were examined in the length east of Townsend between Regional Road 20 at Hagersville and Highway 3 at Jarvis. Of these, MTC has endorsed Route C as far south as Highway 3. Two interchanges at the first and second concessions north of Highway 3 have been proposed to serve Townsend, but the one on the second concession is likely to be moved to the third, because of the future CN railyard.



# Existing Highway Network for Region

- Freeway
- Arterial Highway
- Collector Highway
- Local Highway



Date March 76

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Source: MTC

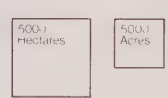






# Potential Highway Network for Region

- Freeway
- Arterial Highway
- Collector Highway
- Local Highway



Date March 76

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Source: NLETS

2.41b









The "endorsed" alignment stops at Highway 3 east of Jarvis. Trips south to the Nanticoke industrial area will be served by Regional Road 55 to the west.

### Regional Roads

The regional road system falls under the jurisdiction of the Regional Municipality, and serves more local intra-regional travel needs.

Generally route continuity in the area is good, except where interrupted by the Tuscarora Indian Reserve to the northeast of Townsend.

Townsend will be served particularly by these regional roads: the diagonal route 20 (Indian Line) up to Brantford, the north-south routes 27 (Townline) and 55 into the Nanticoke industrial area, and east-west route 9 across the top of the site.

### 2.42 Rail Services

The Region is served by three railway companies: Canadian National (CN), Canadian Pacific (CP), and Penn Central.

CN has a line between the Nanticoke industrial area and Hamilton, using a route from Caledonia through Brantford and Dundas. CN plans to upgrade this line for the heavy freight from the Stelco site by bypassing Brantford and Caledonia and linking the new spur from the Nanticoke industrial area to the Hagersville-Jarvis line north of Jarvis. A more direct link between Caledonia and Hamilton will not be used because of the steep grade over the Niagara escarpment.

The CN also has an east-west service through the Region from southwestern Ontario to Buffalo. It is a single rail line where it passes through the southern part of the site, and carries about four trains/day in each direction.

CN has acquired approximately 140 ha north of Jarvis for a long-term marshalling yard to handle freight out of the Nanticoke industrial area. The timing of this project is unknown.

CP operates on a line owned by Lake Erie and Northern between Simcoe and Brantford. CP has



an operating agreement with CN to use their line from Simcoe to the industrial area. CP at one time expressed interest in having a separate link to Stelco via Simcoe, but this apparently has not been pursued further.

The Penn Central line across the top of the site is a bonded carrier between Detroit and Buffalo with limited stops in Canada. Livingstons on the Hagersville industrial site has a spur from this line. This double rail line takes four freight trains/day in each direction.

Amtrak, which uses the Penn Central line, is the only passenger rail service in the Region. It runs one three-five car train/day in each direction between Buffalo and Detroit, stopping in Ontario only at Fort Erie, Windsor and St. Thomas to let off passengers. Permission recently has been given for them to operate a domestic rail service along this line.

The existing lines to Hamilton probably will be unsuitable for passenger services. The main route through Dundas is too circuitous for a convenient service, and the direct route over the escarpment would require costly improvements.

#### 2.43 Bus Services

The work trips to the Nanticoke industrial area are served by several inter-regional and local bus services. With this exception, bus service within the Region outside the urban areas is generally poor because of low demand. (See figure 2.43.)

#### 2.44 Ports

The Nanticoke industrial area will have major dock facilities. Ontario Hydro have their own facility that Texaco will share. Stelco are presently constructing a large docking structure for the exclusive use of their mill works.

The public docks at Port Dover are capable of handling intermediate sized vessels, but have no shore facilities for large cargo volumes.



# Existing Freight Rail Services in Region

- Canadian National (CNR)
- Canadian Pacific (CPR)
- Penn Central
- Toronto Hamilton & Buffalo (TH & BR)



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


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Source: MTC





## Existing Passenger Rail Services in Region

-  Canadian National (CNR)
-  Canadian Pacific (CPR)
-  Amtrack
-  Toronto Hamilton & Buffalo (TH&BR)
-  Major Rail Terminal
-  Frequency per Day in Each Direction

5000  
Hectares

5000  
Acres

10 KM  
10 MI



Date March 76









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## Existing Bus Services in Region

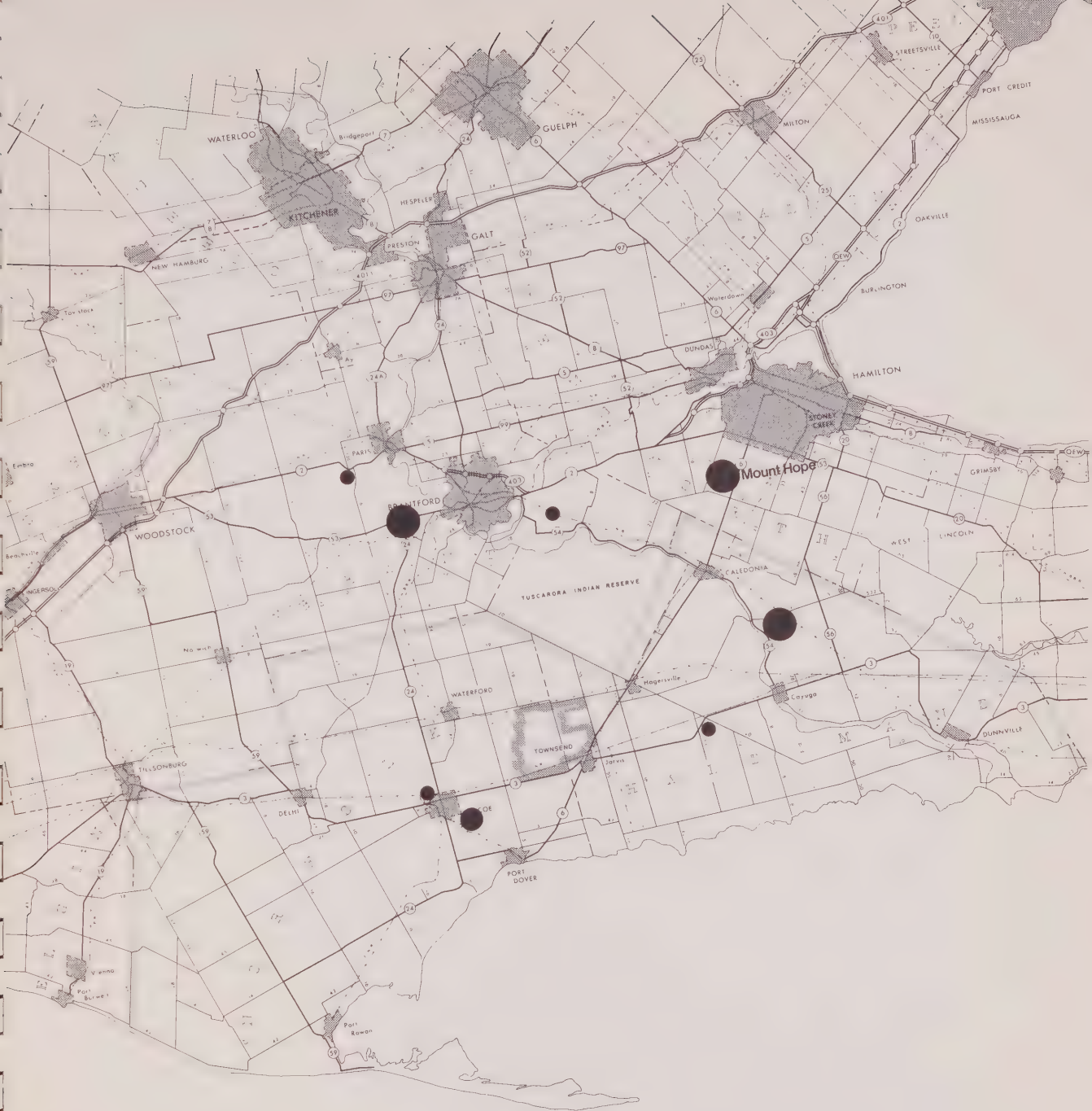
-  Canada Coach
-  Grey Coach
-  Eastern Canadian Greyhound
-  Burley Bus
-  Brantford P.U.C.
-  Heaslip Motors
-  L & H Coachways
-  Frequency per Day in Each Direction



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## Existing Airports in Region

- Public Licence and Services
- Private Licence
- Not Licenced

5000  
Hectares

5000  
Acres

10KM  
10MI



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## 2.45 Airports

Mount Hope airport outside Hamilton is the most important facility west of Toronto and in the Region. It operates intermediate-haul scheduled flights. A study is being conducted of the future airport needs in the area.

There are three other publicly-licensed airfields in the area. (See figure 2.45.) Brantford airport has an asphalt runway and offers private charter flights; the ones outside Caledonia and Simcoe have turf runways used by local clubs.

All of the remaining airfields are privately owned for private use only.

## 2.50 Services

New regional services for water supply and sanitary drainage have been proposed to accommodate the new growth, but the sanitary system will not be available for the initial development at Townsend. Otherwise, the new community must depend upon the existing utility systems for gas, hydro and telephone, all of which can be extended to accommodate both the initial and ultimate development. The storm water system will be directed to the existing watercourses.

## 2.51 Sanitary Drainage System

The sanitary drainage systems have been designed by consultants for the Ministry of the Environment (MOE). Two schemes have been developed for different population growth rates and distributions, but following the Regional Council's recent reconfirmation of Townsend as the growth centre, the MOE is now proceeding only with the detailed design of the so-called "low population" scheme.

In the "low population" scheme, the regional collector system will be provided to Townsend, Jarvis, Hagersville, Port Dover and Waterford. and the Stelco mill site and industrial park. (See figure 2.51.) Most of the system is scheduled for construction in 1976-1981, including the first stage of the control plant and the first pumping station at Townsend in the



Nanticoke watershed. The second pumping station for Townsend in the Black Creek watershed is proposed for 1991-1996, but this can be advanced if necessary.

Because a new collector system will not be provided to Simcoe, its ultimate population would be limited to 22,000, the assimilative capacity of the Lynn River.

The new central water pollution control plant for the system will be located on the shore of Lake Erie west of the Stelco mill site. Treated effluent will be discharged into the lake.

Although the system was designed using assumptions about the growth and distribution of development in Townsend, it has sufficient flexibility to accommodate the actual development pattern. The only component of this system that has been relatively fixed in location is the Nanticoke pumping station, because of constraints on the trunk sewer route to Jarvis.

Because the new regional service will not be available in Townsend until 1981, interim treatment facilities will be required. After investigating the alternative systems, the MOE has recommended using waste stabilization ponds with periodic discharge into the Nanticoke Creek. This creek currently receives secondary effluent also from Waterford, but with the population of this town limited to 4,000, Townsend could accommodate 7,000 until the new regional system is operational.

The preferred location for the ponds is between Highway 3 and the CN tracks west of the Nanticoke Creek, but north of the tracks also is possible. The ponds preferably should be 300 m from the nearest development, although distances as little as 100-150 m have been considered acceptable. The total area required for the ponds is up to 40 ha, which could be divided into units as small as  $2\frac{1}{2}$ -4 ha. These ponds should be considered for later use for storm water retention. (See section 2.53.)

## 2.52 Water Supply System

As in the case of sanitary drainage, two schemes for regional water supply have been prepared for



# Proposed Sanitary Drainage for Region Low Population

- Trunk Sewer
- Pumping Station: Retained
- Proposed
- Water Pollution Control Plant



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One would be constructed in the first phase of the scheme, the other before or during the second phase as required. There is considerable flexibility in the location of these facilities, but ideally they should be placed at the centre of the population and adjacent to open space areas incorporating a natural watercourse.

#### 2.53 Storm Drainage System

The site extends over the watersheds of three stream courses. (See figure 2.53.) These watercourses will form the outlet for storm water runoff from the site and from the upstream watersheds. In order not to substantially increase the erosion of these watercourses, the rate of discharge of storm water from the developed areas must be controlled by detention and/or retention.

The pollutant load carried to the natural watercourses and lakes is an increasing concern. While specific requirements have not been identified, the treatment provided by primary settlement is being actively encouraged. The use of storage ponds would allow for primary settlement, and for secondary and tertiary treatment, if considered necessary in the future.

The temporary waste stabilization ponds (see section 2.51) should be considered for subsequent use for storm water retention. To serve this purpose, the ponds must have depths of up to 5 m in order to accommodate gravity storm sewers.

#### 2.54 Solid Waste Disposal

The Regional Municipality is responsible for the disposal of solid waste. Townsend will be served probably for the foreseeable future by the Howe Refuse Disposal Site, located 5 km north of the site.

#### 2.55 Hydro Supply

The 500 KV and 230 KV transmission corridor to the east of the site links the Nanticoke generating station with the Ontario distribution network. A new 230 KV transmission corridor must be found from this corridor to Townsend and the Simcoe/Port Dover area.



MOE, but they are now proceeding only with the "low population" scheme. Within this scheme, two alternatives are being considered. Full details are not yet available for the second. (See figures 2.52a and b.)

Jarvis, Hagersville, Townsend and the Stelco industrial park and mill site will be served by both alternatives.

The new water treatment plant will be located on the shore of Lake Erie west of the Nanticoke generating station.

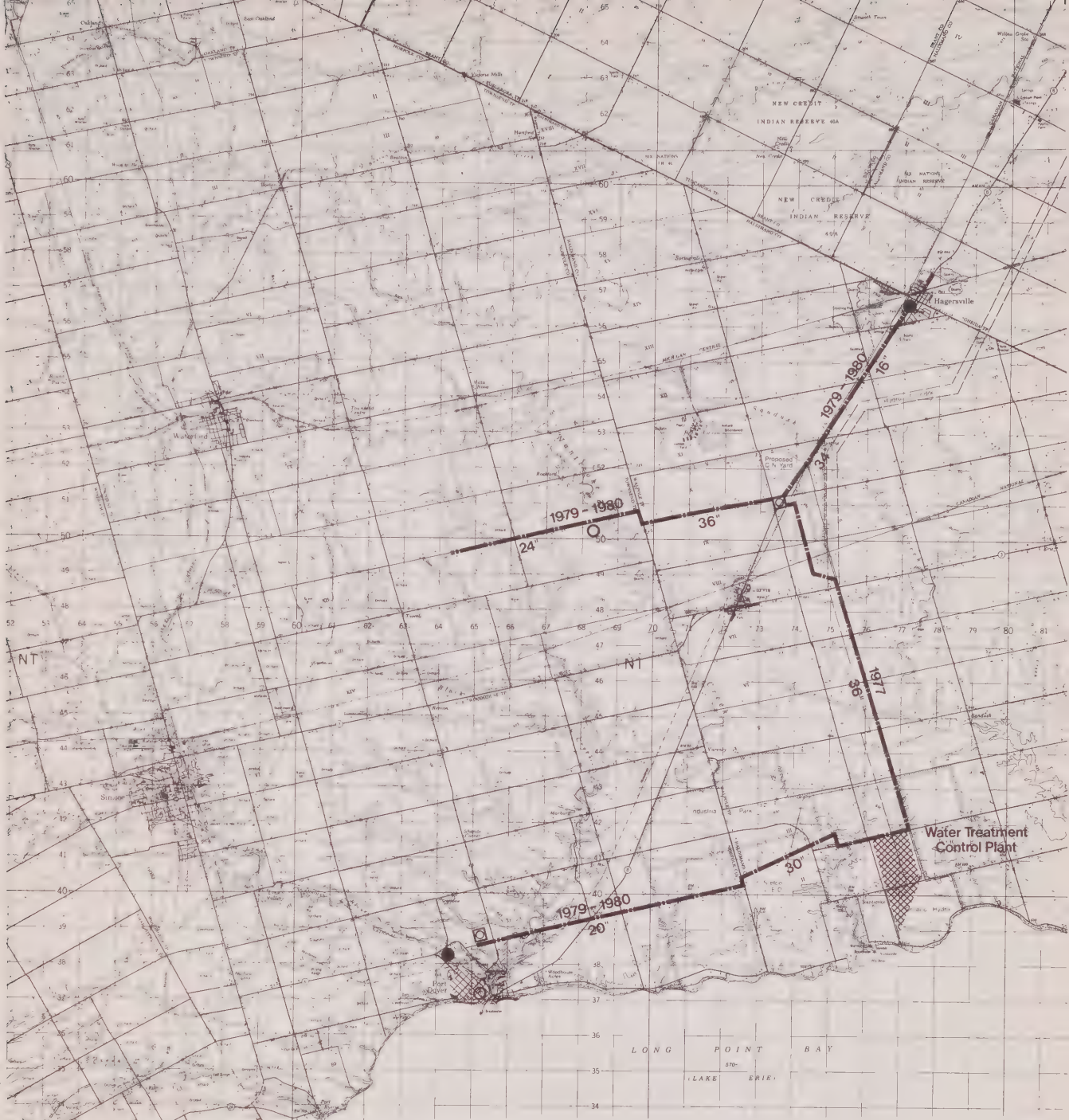
The alternatives use two different routes for the transmission main from the treatment plant to Townsend. These routes also affect the initial storage provision on the site. In the first, the main would run north up the Hydro corridor to the existing reservoir at Jarvis, from which a further main would be taken to an elevated tank in Townsend. The second alternative would run westwards along the utility corridor through the Stelco industrial park, and then northwards possibly alongside the central trunk sewer to a new reservoir at Townsend.

Construction scheduled in the first 1979-1982 phase includes the first stage of the water treatment plant and the trunk service to Townsend, together with the initial storage capacity. The second phase in 1991-1992 includes a parallel transmission main from the treatment plant to the ground storage reservoir either at Townsend or Jarvis. The other components of the system — additional pumping station capacity, the Townsend elevated tank, and/or additional ground storage reservoir capacity — would be phased to meet demands created by population growth.

The watermain to the site can be completed by 1977, but water pumped directly from the treatment plant does not provide a secure supply. Therefore, some on-site storage capacity to be fed by the main also will be required. This can be completed by mid-1978. The present Jarvis water supply system cannot be extended to Townsend, because it is unable to cope with the present local demands.

A ground storage reservoir as well as an elevated tank probably will be needed ultimately within Townsend. The tank could be 55 m high.





# Proposed Water Service for Region : A Low Population

- Transmission Main
- Elevated Water Tank : Retained
- Proposed
- Reservoir and Pumping Station : Proposed



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Source: MoE







## Proposed Water Service for Region : B Low Population

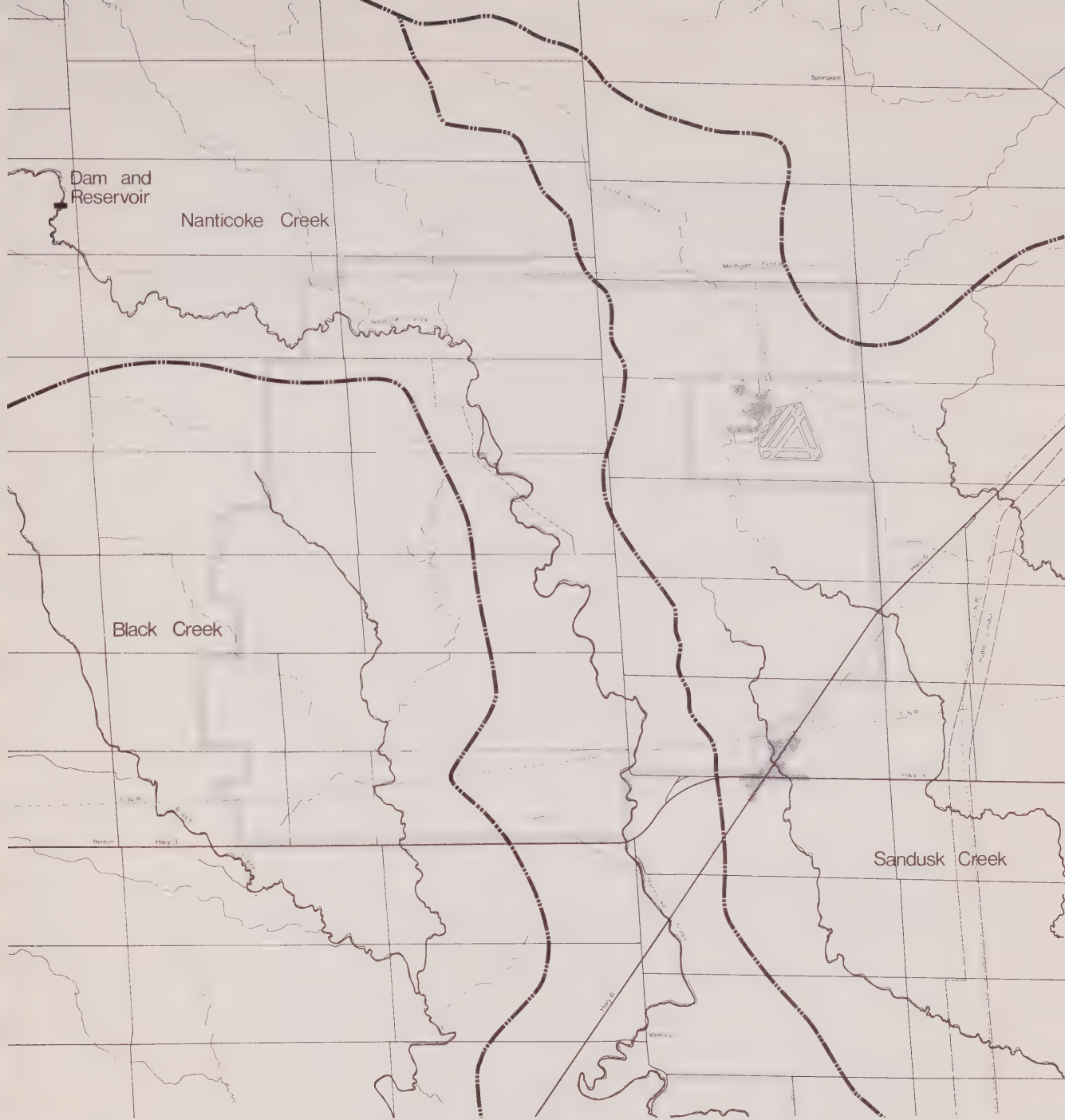
-  Transmission Main
-  Elevated Water Tank: Retained
-  Proposed
-  Reservoir and Pumping Station: Proposed



Date March 76

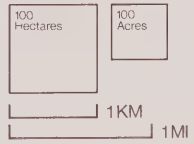
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# Existing Drainage Pattern

- Stream Course
- Watershed



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Hydro within Townsend will be eventually distributed from a transformer station (230KV/27.6KV) located in the site. The first housing units can be supplied from the existing local distribution for Jarvis and adjacent areas until the demand warrants upgrading the system.

#### 2.56 Gas Supply

Natural gas is supplied by the Union Gas Company to the Jarvis and nearby areas from the Tillsonburg gas line, which runs along Highway 3. A distribution main could be taken from this line into the site.

The gas fields lying under the site are largely depleted as a commercial resource.

#### 2.57 Telephone Service

Telephone service to the new community could be provided by the Bell Telephone Company, using initially the existing switching station located in Jarvis for the early development. When warranted by demand, a new switching station would be located within Jarvis.

#### 2.58 District Heating

Waste heat from the Nanticoke generating station potentially could be used in a district heating system for Townsend.



## INTRODUCTION AND BACKGROUND

### 3:00 SITE CONDITIONS

The site for the new community of Townsend is situated to the northwest of Jarvis — west of Highway 6 and north of Highway 3. (See figure 1.10b.) It measures approximately 8 by 9 km and covers approximately 5,650 ha.

Like the surrounding area, the site is mainly flat farmland, sparsely treed and lightly settled. About 180 houses are located mostly in farmsteads along the concession roads. The largest settlement is Rockford with only half a dozen buildings. (See figures 3.10a, b and c.)

The site is crossed by three creeks: the Nanticoke Creek, three tributaries of the Black Creek (the middle is known as Catfish Creek) and three tributaries of the Sandusk Creek.

#### 3.10 Visual Character

#### 3.11 Topography

The land generally falls gently north to south about 26m, from a high point of slightly over 225 m above sea level west of the Townline Road at the northern boundary to a low point in the Nanticoke Creek valley at Highway 3. The flat tableland west of the Nanticoke in this vicinity is around 207 m.

A large part of the site east of the Nanticoke is virtually flat with slopes of less than 0.5%.

The only marked changes in topography are related to the stream courses. The Nanticoke valley is well-defined in places by modest banks,

no higher than 12 m in the south and central sections and less to the north. The land becomes more rolling towards the southwest around the Black Creek tributaries.

### 3.12 Agriculture

The area is predominantly in agricultural use, which has had a significant effect on its visual character.

The agriculture has been recently characterized by a very wide diversity of uses throughout the area. Cash cropping as well as livestock production for hogs, beef cattle and poultry are widely practised, although the larger and more specialized livestock operations are located on the eastern part of the site. Similarly, the production of forage crops and feed grains are scattered over the area, but the larger acreages also are found to the east. Dairying operations largely are concentrated in the middle. Canning crops like tomatoes, cucumbers and sweet corn are localized in the northwest sector, as are the two most productive orchards for cherries, apples and grapes.

The Norfolk sandplains and their rich tobacco-growing farms occur in the area further to the west of the site.

### 3.13 Woodlands

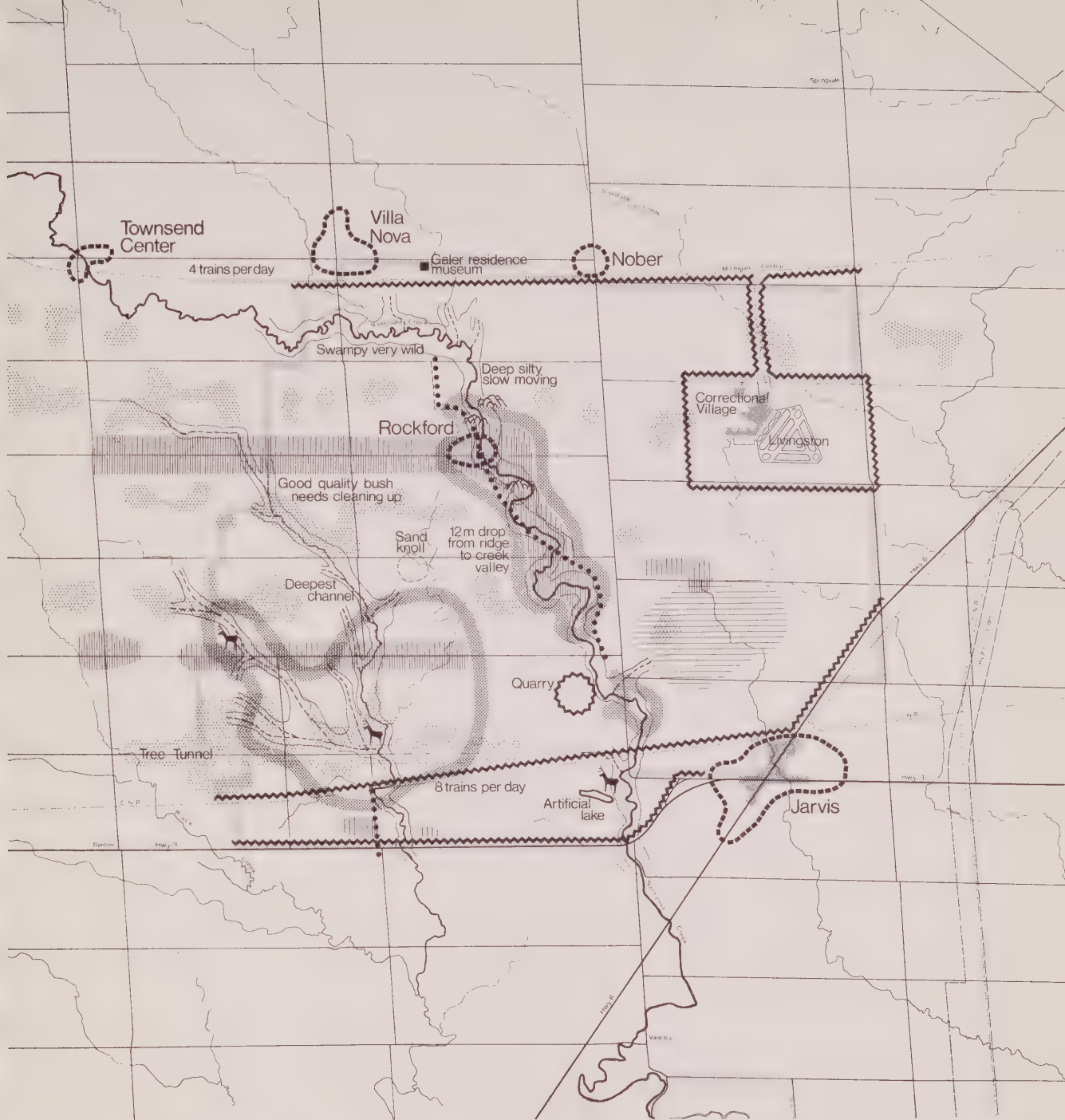
As in other sections of rural Ontario, past agricultural uses have practically eliminated all forests. Only about 7% of the site is covered by trees.

The area west of the Nanticoke contains some large and nearly continuous woodlots running between the east-west concession roads. This characteristic pattern occurs in many rural areas, where historically, farmers cleared their land back from the concession roads and used the wood for energy requirements.

The area east of the Nanticoke Creek is sparsely wooded and the woodlots are small and isolated.

The edges of the creeks are only intermittently bordered by trees. The most scenic areas are along the Nanticoke Creek around Rockford, and in the Black Creek watershed mainly on the Catfish tributary.

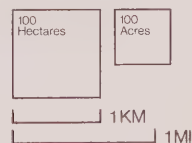




## Visual Character & Conditions of Site

- Tree Screens
- Varied Landscape
- Area of Historic or Architectural Character
- Wet Fields
- Visual Barriers or Edges

- High Quality Habitat
- Visual Envelope of Towns
- Old Trails
- Rock Outcropping, Waterfall
- Creek, Seasonal Tributary & Valley Definition



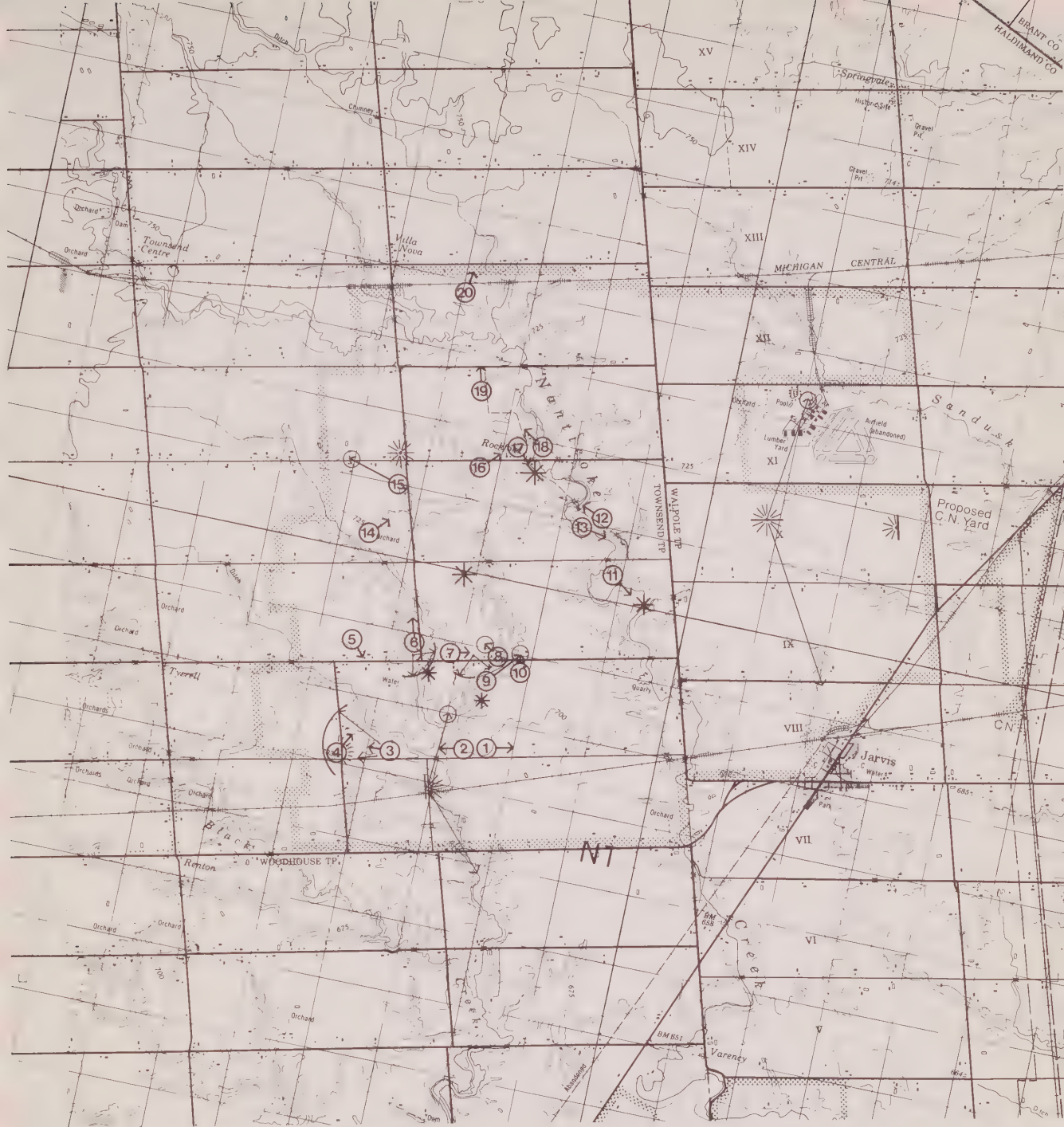
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## Visual Landmarks and Views



Panorama



High Points and Knolls



Vista



Focal Point



Photo Views

100  
Hectares

100  
Acres

1 KM

1 MI



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1



2



3



4



5



6



7



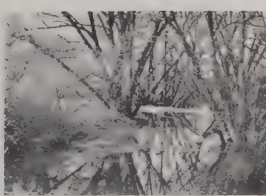
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11



12



13



14



15



16



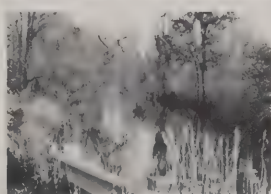
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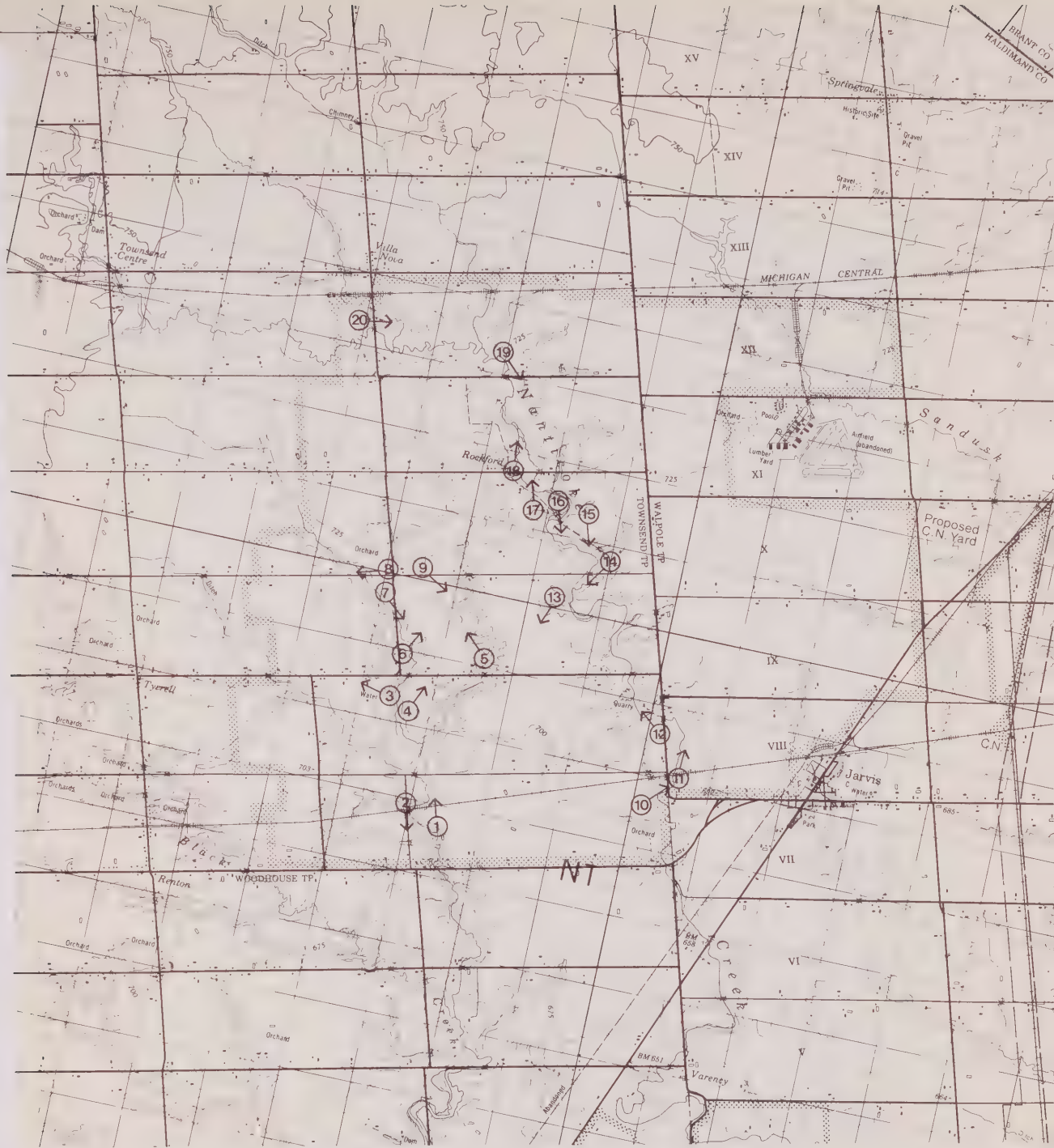


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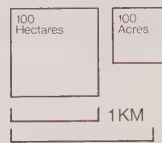
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## Natural Landscape Features

Photo Views



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### 3.14 Development

The village of Jarvis southeast of the site is a small, rural farm service centre of 1,300 persons, with attractive tree-lined streets and substantial red brick houses. (See figure 3.14.)

The pocket of land excluded in the northeast sector of the site is largely an industrial area on a former wartime training airfield. 270 ha in the area are now owned and used by a packing and shipping company and a further 145 ha are zoned for industry but not used. This fenced area is a significant feature on the flat landscape; the water tower especially can be seen from afar. The rail spur line into the area also is fenced and severs the northeastern corner of the site.

Rockford is an important cultural landmark within the site. Once a rural service centre of 50 people with a hotel and four mills during the 19th century, it now contains only a handful of buildings; a former schoolhouse, church and cemetery, a few houses and vacant structures. (See section 3.32.)

The farmsteads contain a significant number of farmhouses and buildings of architectural and historic interest, especially along concession road 10 leading into Rockford and concession road 12.

The quarry next to the Nanticoke is being excavated for low-grade aggregate for roadbeds. The present operations take about 3 ha of land, but permission is being sought for clearing 20 ha in total before the termination of the lease in 1977. The permission, if granted, will require minimal remedial landscape treatment. The quarry, although now unattractive, has the potential for being reclaimed and developed into an attractive pond.

### 3.15 Infrastructure

The existing concession road network within the site is a rectangular grid formed by a single front survey system laid out around 1900. The east-west roadways are for the most part continuous and spaced at about 1.3 km, although they are offset by 300 m at the Townline Road. The north-south roadways

have a much wider spacing at 3.6 km and are interrupted in a number of places by the stream valleys. Virtually all of the concession roads are gravel surfaced with rights-of-way of  $19\frac{1}{2}$ -20 m, except for the Townline Road with 30 m.

The local roadways have remained under the jurisdiction of the City of Nanticoke. The diagonal roadway near Rockford, called Messecar Road and Anderson Road, was a private road.

The site is crossed by two east-west railway lines: the Penn Central railway across the north is a double line with a  $27\frac{1}{2}$  m right-of-way, and the Canadian National (CN) railway across the south has a single line in a 20 m right-of-way. The CN railway, which is elevated with only two small underpasses, tends to create a strong visual and physical barrier across the site.

### 3.20 Development Constraints

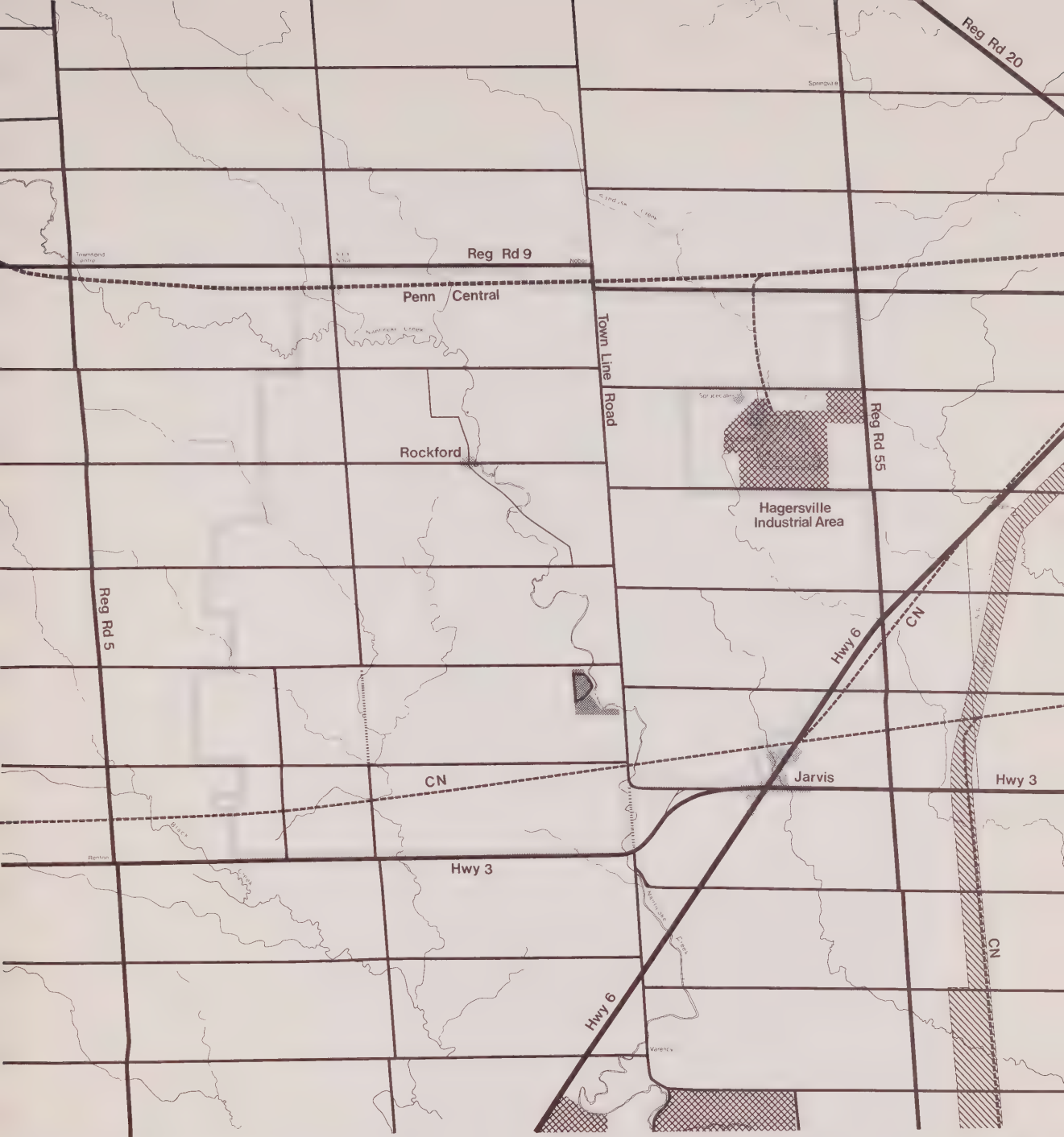
The physical resources of the site are reviewed under three categories. Abiotic resources are non-renewable, while biotic resources are renewable if properly managed. Cultural-historical resources relate to the site's past human occupation. Where these resources conflict with the future urban development, they become development constraints. Where they facilitate development of the site or provide a significant amenity, they become development opportunities. (See section 3.30.)

### 3.21 Abiotic Resources

The geology of the site consists of the recent soil over the Pleistocene sediments, and then the Paleozoic bedrock.

The Pleistocene deposits are predominantly post-glacial lake sediments of clay, with some silt and sand in the western part of the site. This layer, which is exposed locally in some stream courses, is no deeper than 20 m within the site.

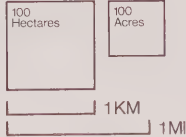
The Paleozoic bedrock is cherty limestone. The bedrock slopes generally from an elevation of about 215 m in the north to about 190 m in the south.



# Existing Development on Site

- Road Rights-of-Way
- 120 ft.
  - 100 ft.
  - 66 or 64 ft.
  - 40 ft.
  - Unsurfaced Rights-of-Way

- Rail Rights-of-Way
- 90 ft.
  - 66 ft.
  - Quarry Area : Existing
  - Potential
  - Industrial Area : Zoned
  - Hydro Corridor



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Source: MTC and TCDP



## Bedrock

Shallow overburden of 5 m and less occur outside the valleys in the southeast, northeast and northwest corners of the site and also in a small part in the middle. Development in these areas could be costly, if excavation into bedrock is required. (See figure 3.21.)

Possible sinks in the limestone bedrock caused by the collapse of caverns could be a development constraint. Depressions in the overburden, indicating the possibility of such sinks, were found in a strip running diagonally across the site. However, this condition might exist anywhere in the site, suggesting care must be taken prior to locating structures.

Gasfields occur near Jarvis and on the western edge of the site, while isolated gas wells are scattered throughout the site. Gas leaks, particularly into basements, could be a major hazard because the natural gas is odourless and highly explosive. The leaks can occur through natural fissures as well as uncapped or imperfectly capped gas wells. The developer would be responsible for capping all abandoned and uncapped wells with no owner of record.

## Soils

In general, the surficial sediments offer no severe limitations to urban development with the exception of steep slopes and poorly drained soils. These conclusions are based upon an initial shallow soil analysis that will be checked by a more detailed analysis in Phase II.

Steep slopes occur only locally, along the major creeks, where erosion has carved gradients of 9% to 30%. Disturbance of these slopes could cause additional erosion with a resulting increased sediment loading in the creeks. Construction costs on steep slopes are also higher than normal for many building types.

Surface ponding occurs throughout the site wherever predominantly heavy-texture soils are found with level or slightly depressed land. The larger and more common areas of prolonged saturation are east of the Nanticoke, particularly just northwest of the Hagersville industrial area. In these areas, dewatering operations will



be required for all below-grade construction. There also is increased potential for water seepage into basements and seasonal delays in construction activity during wet periods of the year.

Dewatering operations for excavations also may be necessary in the southwestern part of the site, where quicksand conditions could be produced by a combination of sand overlying clay and a perched water table.

Permanent high water tables at 5 m or less from the surface are unlikely outside of floodplains.

No extensive aquifers in the overburden were apparent from well records, and any bedrock aquifer is well protected by the overlying clays. Therefore, possible pollution by the development is unlikely.

Other areas within the site have soil limitations of a less severe nature that are generally responsive to remedial measures.

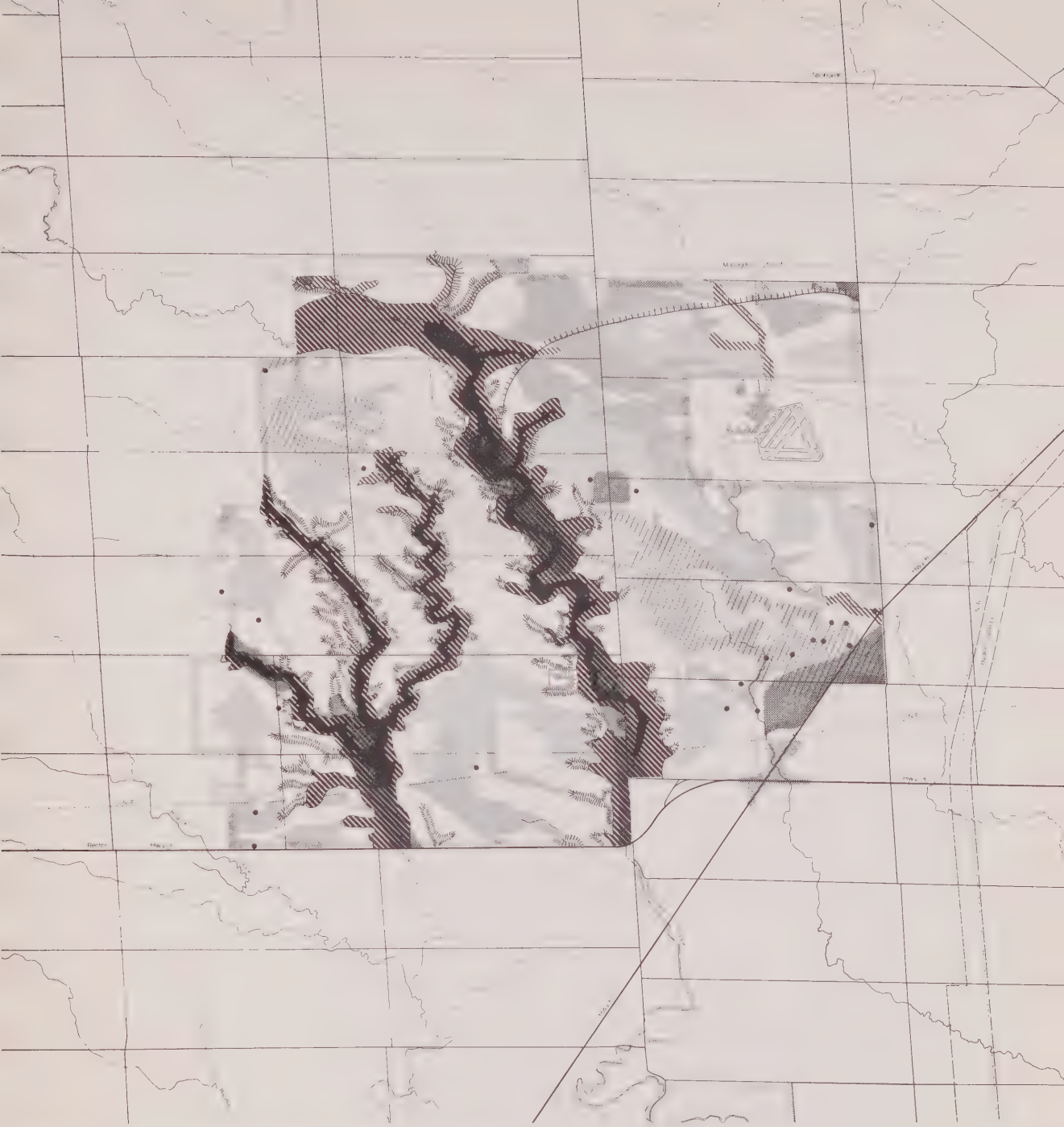
### Flooding

The susceptibility of the creek valleys to flooding, as shown by the recent alluvial sediments and the instability of the valley walls, are the major abiotic constraints of the site.

The watercourses in the site come under the jurisdiction of the Long Point Conservation Authority, which is currently having floodplain mapping prepared for the site. Final copies of the flood and fill lines on the Black Creek tributaries have been made available, except for the southernmost end. Final fill line mapping on the Nanticoke Creek has not been made available, nor any material on the Sandusk Creek. A complete draft report is expected this April.

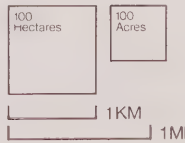
The mapping of the flood line is based on the worse of two storm criteria: either "Hurricane Hazel" or a return frequency of once in 100 years. The conservation authority most likely will prohibit the construction of any building or structure within this line.

The fill line is derived by taking a setback from the top of the natural geological floodplain, with modifications for the topography



# Abiotic Constraints for Development

- Flood Plain (Incomplete Data)
- Fill Line
- Shallow Overburden (Less than 5m. to Bedrock )
- Poorly Drained Soils (<50% of Area)
- Steep Slopes (More than 9%)
- Other Areas Liable to Seasonal Flooding
- Possible Bedrock Depressions
- Gypsum Bearing Formation
- Gas Wells
- Poorly Drained Soils (>50% of Area)



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Source : Dillon, MNR, ESP and Dr. Chesworth



and vegetation cover. The authority has the power to prohibit or regulate the placing or dumping of fill within the line, if it will affect flooding, pollution or the conservation of land. The authority will not necessarily forbid construction within this line, but it has the power to review plans and check that the engineering design does not risk human safety.

### 3.22 Biotic Resources

#### Woodlands

The few woodlots on the site can be characterized as remnant hardwood stands, located either on poorly-drained back farmlots or within the valleylands. (See figure 3.22.) Most have been disturbed by cattle grazing or hardwood cutting. The woodlands are not of exceptional character, but can be improved through a woodlands management program.

If properly done, residential development could be placed within nearly half of all the woodlands without causing the collapse of the forest ecosystem. The balance of the woodlands are unsuitable for any urban development without the risk of very high tree mortality, due either to their biological characteristics or their location within the valleylands. These woodlands can be utilized, however, as passive recreational lands, natural buffers between different land uses, and for hardwood production.

#### Watercourses

The stream quantity information is available only for Nanticoke Creek, which indicates a considerable flow variation within each year that ranges from 5-200 cfs. The low flow would prohibit any discharge of treated sewage effluent half of the year.

The Sandusk tributaries are essentially swales receiving agricultural run-off. They, and the upper reaches of the Black Creek tributaries, are seasonally dry.

The water quality of the streams is relatively poor, and generally deteriorates as they flow south. This can be attributed largely to agricultural practices, and in the case of Nanticoke Creek, to treated effluent from Waterford.

The fisheries habitat in these watercourses is limited by the low summer base flow. The Nanticoke is capable of supporting typical warm water fish; the others are uncertain.

### Wildlife

No unique wildlife species or specialized wildlife habitat has been found on the site. Any important habitats will be preserved by protecting the stream valleys and main woodlands.

### 3.23 Historical and Cultural Resources

Townsend is probably rich in archaeological remains, judging by the intensity of aboriginal occupation in surrounding areas, but a ground survey is essential for a full assessment of resources.

Two archaeological sites are known. Both are highly significant and should not be disturbed by development until properly excavated. (See figure 3.23.)

The site was actively settled by Caucasians from the second quarter of the 19th century, and contains several buildings of historic and/or architectural significance for this period. A major cluster occurs at Rockford (see section 3.32) while a significant number also are located along concession roads 11 and 13 west of the Nanticoke Creek. Several former mill sites are found along the Black Creek tributaries and Nanticoke Creek.

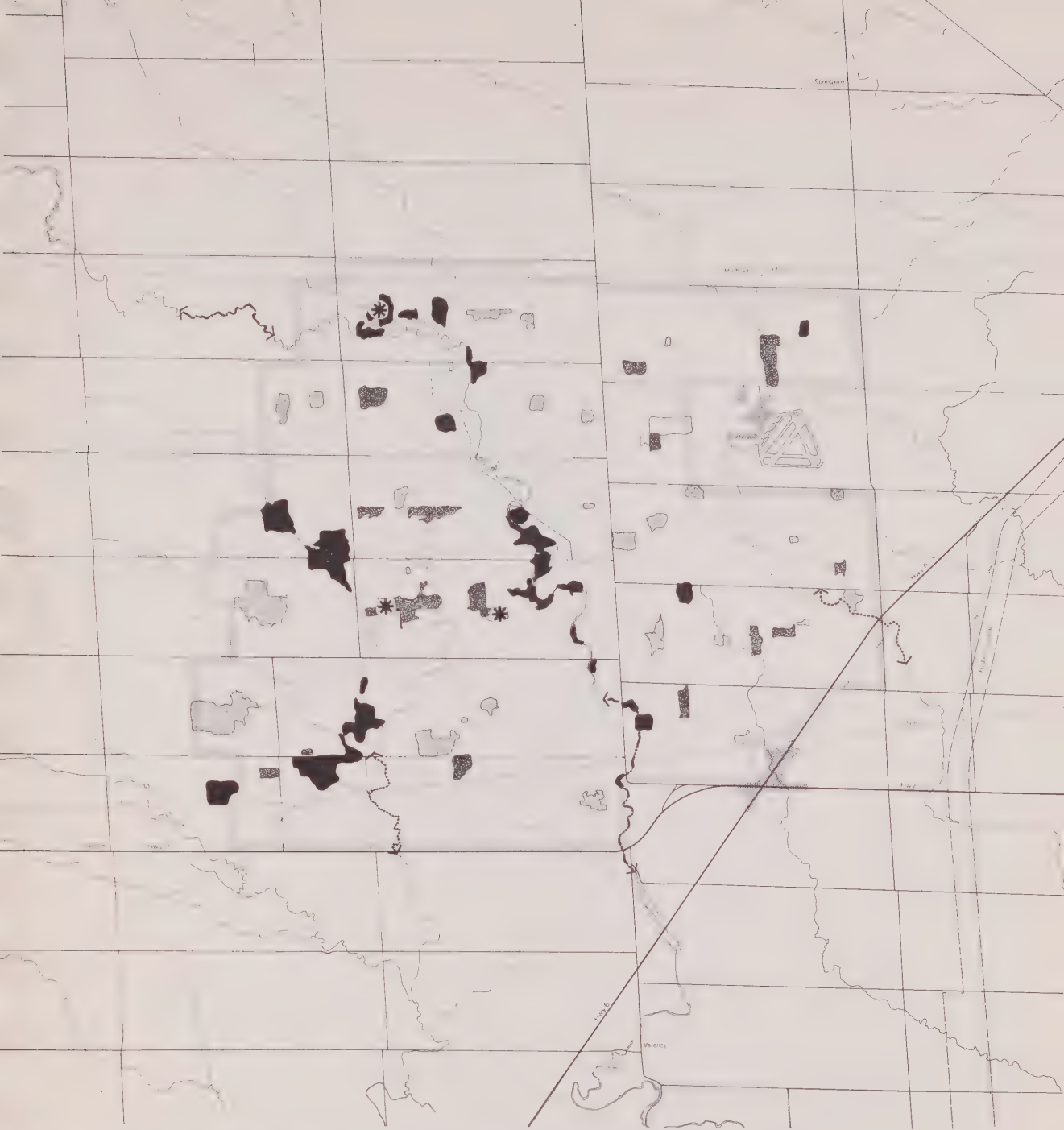
### 3.30 Planning Assets

The site has many existing physical assets that should be retained, utilized and, if possible, enhanced. Agricultural land is clearly the most important of these; but others include recreation resources and exploitable materials.




### 3.31 Agricultural Capabilities

The site is now used predominantly for agricultural production in a diverse range of operations. (See section 3.12.) Even after the





## Biotic Constraints to Development

 Woodlots: Low Acceptability for Urbanization  
 Medium Acceptability for Urbanization  
 High Acceptability for Urbanization

 Water Quality: Medium  
 Medium to Low  
 Low

 Suggested International Biological Program Sites

Source: MoE and Ecoplans



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development of the community for 100,000 a large part of the area will remain in permanent agricultural production. The agricultural characteristics of the site were examined, to gain an overall understanding of its capabilities, but also to identify those portions having the most favourable conditions for permanent agricultural use.

### Evaluation Factors

The agricultural areas were evaluated using entirely existing surveys broadly related to the soils, the farmland, and the management of the farms.

The soils survey by Canada Land Inventory measures the inherent capability of the soils to produce common field crops. This assessment is unaffected by the existing use or land improvements. Class 1 soils, which are the best of five classes found in the site, cover roughly 50% of the area and are spread generally throughout. Classes 2 and 3 cover most of the remainder.

The farmland survey by Ontario Ministry of Agriculture and Food (OMAF) is a field by field assessment of the soil, drainage, presence of tile drainage, topography, past management, field size and shape, any obstructions to cultivation, and all other factors that affect operational efficiency or indicate the need for land improvements. A-1 farmland is the best of three classes of workable farmland identified on the site. Roughly 30-40% of the site was classified as such, with the main concentration in the northwest.

The management survey by OMAF, based on the 1975 crop year, assessed the farm holdings by the present leasing arrangements, their size and farm structures, and the type of farm production. Holdings with the original owner were considered important, as this indicated an attachment to the land as well as some familiarity and skill in working it. Within this group, dairy and market gardening operations were given priority over cash crop and livestock due to the high capital investment needed in the former type of operations. Market gardening also requires specialized management skills and indicates the presence of better agricultural soils, which are

capable of diverse types of crop production. Holdings with original owners were spread throughout the site, comprising roughly 70-80% of the total area. The prime holdings in dairying and market gardening constitute roughly 25% of the site, with some concentration in the northwest.

### Overall Evaluation

When these surveys were combined, the areas that emerged as being the most suitable overall for agricultural use were generally west of the Townline Road and north of the 13th concession road. (See figure 3.31.) On the other hand, the area given lowest priority was the very southern portion of the site on both sides of the CN tracks, and in the area east of the Townline Road north of Jarvis and surrounding the Livingstons industrial area.

This assessment of the existing agricultural capabilities of the site must be extended to include planning considerations arising from the new urban development. If farming is to be retained as a viable undertaking on the site, the extent of urban development should be clearly defined well in advance. The farming area should be compact and contiguous. Finally, the two areas should be separated by a buffer, preferably of open space, incorporating major woodlots and/or valleylands.

The location of the new community must be also examined in relation to the agricultural operations outside of the site. If possible, the development should be kept away from valuable speciality croplands that occupy the land immediately west of Townsend.

### 3.32 Recreation Potential

Townsend is midway between two regional recreation features — the Lake Erie lakeshore and the Waterford Conservation Area. Nanticoke Creek connects both areas and can provide a major open space corridor. Black Creek and its tributaries also have a similar potential.

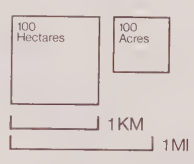
The inherent natural features of the valleys of these two systems offer a variety of opportunities for recreation. They can provide excellent trails for hiking, bicycling and cross-country skiing; facilities for fishing (primarily children fishing for panfish); tobogganing; skating on adjacent ponds; and viewing.





# **Priority Areas for Non-Urban-Use** **Preliminary Appraisal**

- High
- Moderate
- Low



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Source: ESP





The cluster of historic buildings at Rockford — combined with the small waterfall, the cemetery, the former mill sites in the valley, the Anderson Road and the archaeological site — represent an opportunity to develop a 19th century rural village. Reconstruction of the former dam and millpond in the valley would further enhance the atmosphere as well as provide for a number of outdoor activities. This area also could be reinforced with other recreational facilities like a small native animal zoo, demonstration farm or demonstration sugar bush, plantation. Finally, while the other historic and architecturally significant buildings should be retained as far as possible in situ, if this is not possible, then their removal to Rockford should be considered. Such a complex could become a major open space amenity and regional tourist attraction.

While the creek valleys offer major open space corridors in the north-south direction, the east-west links are less obvious. However, a number of woodlots and hedgerows can be reinforced with new planting to also provide natural east-west corridors, and thereby complete the open space network. The better quality woodlots can be used for passive recreation like hiking, nature education and maple syrup demonstration.

### 3.33 Exploitable Resources

The bedrock resources include natural gas and gypsum. The gasfields are largely depleted as a resource. The gypsum-bearing salina formation under the northern part of the site, however, is part of the only accessible and workable deposit known in Ontario. Development in this area should be restricted so that this deposit is available for future exploration.

The surficial resources are of low value. Sand and clay are present, but can be found in great abundance off site. Gravel deposits appear to be negligible. The quarry on site is for low-grade aggregate. (See section 3.14.)

The waterwells on the site produce at a rate sufficient for domestic and stock purposes, but not for municipal or most commercial purposes. Some of the water is sulphurous.



## CONCLUSIONS AND RECOMMENDATIONS

### 4:00     OUTSTANDING ISSUES

The initial studies in Phase I revealed a number of issues affecting the planning of the new community. Most of these concern the relationship of Townsend to other developments in the surrounding area and region. Others concern implementation and management questions specific to Townsend. While most of these issues will be examined further in Phase II of the work program, they are all reviewed at this time to initiate discussions toward developing appropriate regional policies or proposals, and also to seek guidance about the possible direction of the Phase II work.

### 4.10     Regional Centre

Townsend will serve as the regional centre, providing services and facilities to both its own population and that in surrounding areas. Although this role now has been confirmed, the timing and character of the centre must still be resolved as part of the ongoing planning studies.

By the year 2001, Townsend, with a projected population of 60-80,000, will be the largest urban area within Haldimand-Norfolk. It will have three to four times the population of Simcoe, the next largest town. The total potential catchment within the Region will be about 200,000, of which Townsend itself could contain 40%.

In order to place the town in its wider context, however, it should also be noted that Hamilton, only 40 km from Townsend, will have about 400,000 residents at this time. The nearby urban areas of St. Catharines-Thorold also will have populations of 200,000 and 100,000 respectively. (See figure 4.11.)

In 1986, the projected regional catchment will be about 125,000, of which Townsend would have only 15%. Townsend will be a major community in the Region, the general size range of Simcoe. However, Townsend and Simcoe will both be considerably smaller than the surrounding urban areas of Brantford (90,000), St. Catharines-Thorold (150,000) and Hamilton (340,000). (See figure 4.11.) Residents of both communities probably will continue to depend on these larger centres for many services, like major retail, health and post-secondary educational facilities.

#### 4.11 Tentative Facilities in the Regional Centre

The nature of a regional centre has been examined for two critical time periods: at a mature state of 60-80,000 people and at the first stage of 20,000 people. Potential facilities in the centre have been listed for these thresholds using planning data from other existing Ontario communities, new towns and general planning guidelines. The specific facilities feasible for Townsend will be determined during Phase II of the work program after the existing facilities in the Region are reviewed.

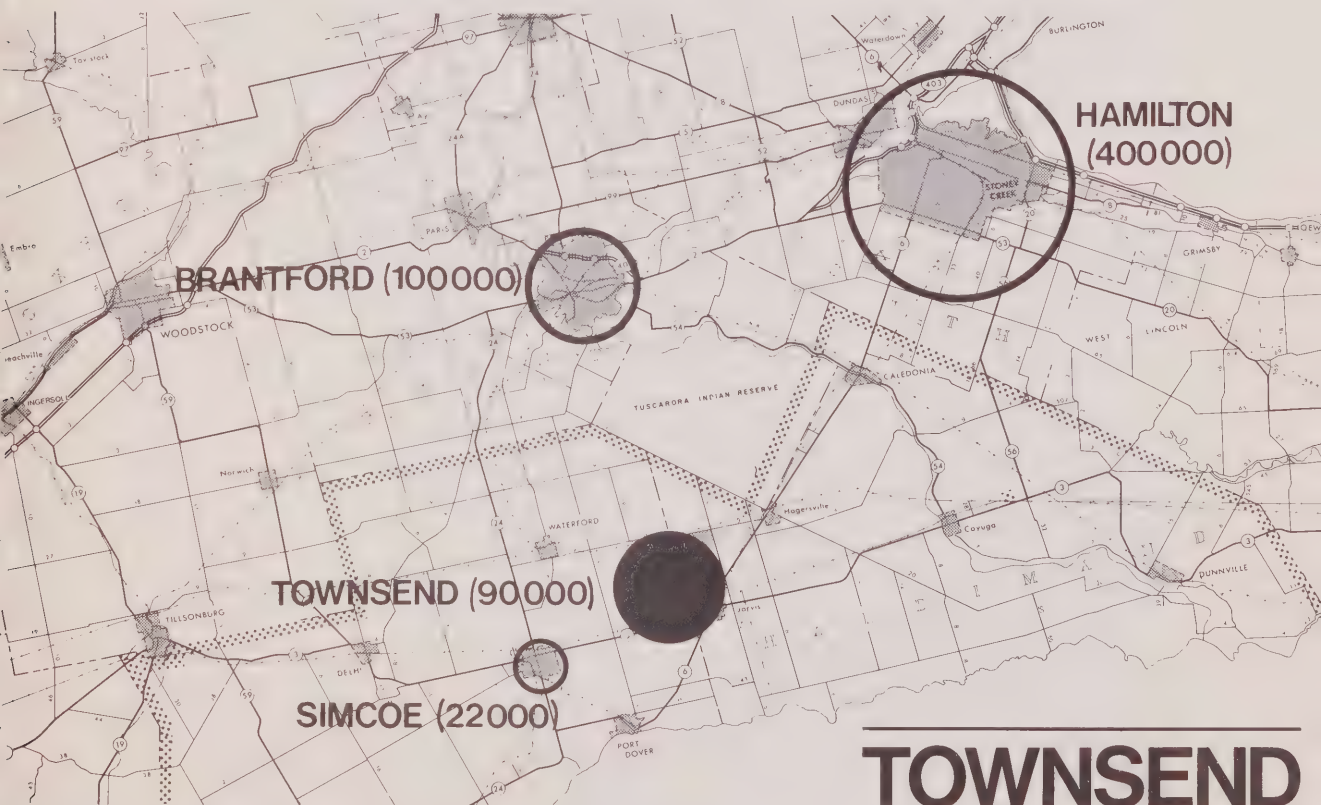
When Townsend has reached a population of 60-80,000, judging by comparative data it can be tentatively suggested that the town will have all or most of the following facilities: a community college, a hospital, one major department store, an airport, bus and rail services, and government offices. The provision of major recreational, cultural and entertainment facilities and commercial services is probable but less certain. (See table 4.11.)

The potential range of facilities at the 20,000 population level is relatively smaller in size and less significant in regional impact than those later. The largest facilities might





**Population Distribution in Region: 1986**



**Population Distribution in Region: 2001**

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Table 4.11:  
Major Facilities in Townsend at 20,000 and 100,000 population

Function:	Facilities:	
	1986	2001
Education	Secondary school Separate Roman Catholic elementary school	Community college Specialized educational facilities (e.g. adult training school for the blind, deaf)
Government/ Institutional	Administrative offices for City of Nanticoke and Region of Haldimand-Norfolk Public service agencies (e.g. School Board, Children's Aid) Some government offices (e.g. Post Office, Public Assistance)	Administrative offices for City of Nanticoke and Region of Haldimand-Norfolk Public service agencies (e.g. School Board, Children's Aid) Federal government offices (e.g. Post Office, Manpower, Immigration) Local provincial government offices (e.g. Courts, Public Assistance)
Shopping	1 supermarket Convenience stores with 6,000-7,000 square metres of retail space	Major shopping facilities with at least one major department store, a discount store, 1 or 2 supermarkets, specialized shops
Recreation	Outdoor swimming pool Indoor ice arena 2 baseball diamonds, football field, soccer field Curling rink Golf course Regional open space system	Major open space system with intensive recreational uses (e.g. hiking and riding trails, large playing fields) 2 golf courses Sports complex with swimming pool, stadium, track, etc. Zoo/bird sanctuary
Culture/ Entertainment	Branch library/art gallery Auditorium (perhaps part of secondary school) Small historical museum	Main library Community information centre Art gallery Museum Civic centre including theatre/auditorium facility Hotels (300-400 rooms)
Offices	Small businesses and professional services	Small businesses (e.g. lawyers) Branch offices (such as real estate, insurance)
Health	Community health clinic Nursing home Special health facility, e.g. home for mildly disturbed, therapeutic day care centre)	Hospital (between 240-320 beds) Public health building Nursing home Special therapeutic or health facility (psychiatric or handicap centre, sanitorium, etc.)
Transportation/ Communications	Bus terminal Non-commercial aviation field Local newspaper Perhaps a radio station	Regional transit interchange Non-commercial aviation field Radio station Local newspaper

include a supermarket, secondary schools, a library and health clinic, and some sports facilities.

The regional influence of Townsend at the 20,000 population level, therefore, will be very dependent upon the planning policies of the Region and the promotional policies of the development corporation. To become a regional centre in actuality, the centre of Townsend must provide services extending beyond its boundaries, and covering the entire Region. To achieve this degree of influence, all or most of the new "one-of-a-kind" and "higher-order" facilities in the Region, whether arising from the population growth or existing deficiencies, should be concentrated in this centre as they are required. Similarly, as a marketing strategy, the development corporation should probably accelerate the provision of some facilities in the earlier years to attract early residents to Townsend or to provide some unique facilities to help foster an early sense of identity.

The concentration of regional facilities within Townsend will probably serve the Region's overall interests as well as Townsend's. Although the central role of Townsend within the Region eventually would appear to be assured by virtue of it being the dominant population mass, the Region as a whole could still lack a clear focus. The existing population looks to the surrounding cities outside the Region for major services and facilities. These cities will grow, and continue to have an influence in the area. Reinforcing the role of Townsend to the fullest extent possible will probably be the only effective way of counter-acting this influence, and providing the Region with a sense of cohesion and identity.

#### 4.12      Development Strategy for the Regional Centre

If Townsend is to be the new regional centre from the outset, it will be necessary to locate within the town all major "one-of-a-kind" facilities as they become available for development. Nevertheless, this preliminary review of the size and nature of Townsend's centre suggests that the major facilities — particularly and most

importantly, comparative shopping — will not be established at a date well into the future. This raises the fundamental issue of where the early facilities might best be located to foster the development of the regional centre by creating an early focus, while also allowing for the long-term orderly growth of the centre.

Three alternative methods of achieving to various degrees these two conflicting objectives have been identified. In summary, they are the following:

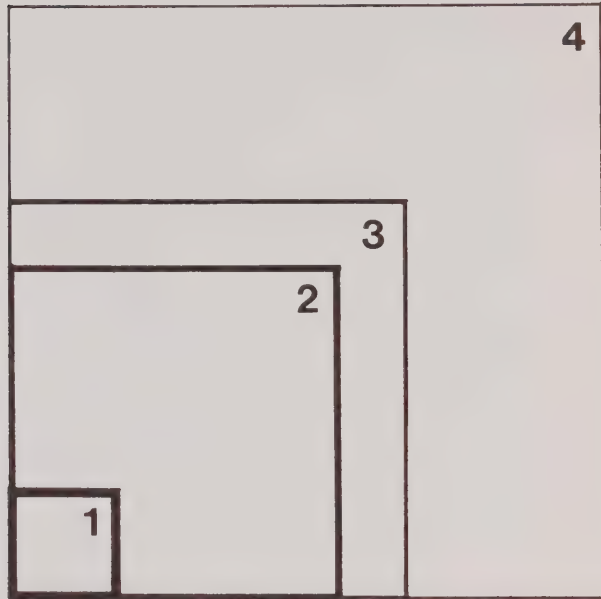
- 1) To locate all of the regionally-oriented facilities within the local centre serving the community of 20,000. In this case, provision would be made for the expansion of the centre to accommodate the later facilities as the town grew; or the subsequent regional facilities could be located in other local centres or on their own separate campuses.
- 2) To locate the regionally-oriented facilities in an area separate from the first community, but within the ultimate town. In this case, the residential fabric would grow towards, and engulf, the regional centre. The main components of the centre could be phased in as a package together with the surrounding higher-density housing.
- 3) To locate the regionally-oriented facilities in an area separate from the first community, and on the edge of the ultimate town envelope. In this case, the regional centre could grow at will without concern for its physical integration with the residential fabric of the town.

The first alternative represents the traditional approach. This serves well the early residents by creating a single all-encompassing centre, but does present problems for growth because of the great disparity between the size, function and character of the initial local centre and the mature regional centre.

This difference can be most readily shown by comparing the land requirements for the various centres. (See Appendix C and figure 4.12.)



Figure 4.12:  
Comparative Sizes for Local and Regional Centres  
(Scale = 1:10,000)



- 1 Minimum Local Centre for 20,000 with commercial facilities only
- 2 Maximum Local Centre for 20,000 with all major commercial, recreational and institutional facilities
- 3 Minimum Regional Centre for 100,000 with major commercial facilities only
- 4 Maximum Regional Centre for 100,000 with all major commercial, recreational and institutional facilities

It should be noted that the comparison does not include upper density housing, which might be associated with a larger centre, and would further exaggerate the difference.

This comparison of the various land requirements suggests that this type of centre could be developed in two ways. First, space could be left for the additional facilities, but the consequence would be that the residential fabric would be separated from the core on one or two sides by a substantial undeveloped area. Second, the local centre could be systematically redeveloped for the major commercial facilities, but this process could be disruptive.

In the second alternative, the planning of the centre could be undertaken at a later date when the requirements of the various uses in the centre were better known. By virtue of the more considered planning and its separate location, it could be developed without significant disruption to the established community. The drawback is that the early regional facilities must be located either in a relatively remote "greenfield" setting, or use temporary facilities in the early years within the local centre.

The third alternative would be similar to many recent highway-oriented "out-of-town" shopping centres, but with a larger complement of non-commercial facilities. It shares some of the advantages and disadvantages of the second, but introduces two new considerations. By being separate from the community, this centre might be able to better cater for the automobile, as regionally-generated traffic would not be brought into the community, and space could be more readily provided for car parking. However, the uses in this type of centre might be less diverse than those in the alternative centres because of its relative remoteness from the community.

#### 4.13 Early Location for the Regional Administrative Centre

The Regional Municipality presently has about 110 employees. The engineering, treasurer's, building control, welfare and parts of the planning offices are in Simcoe; the rest of the facilities are in Cayuga. The conditions are cramped and concern has been expressed about staff inefficiency, public inconvenience and the additional cost arising out of having the two offices 25 miles apart.

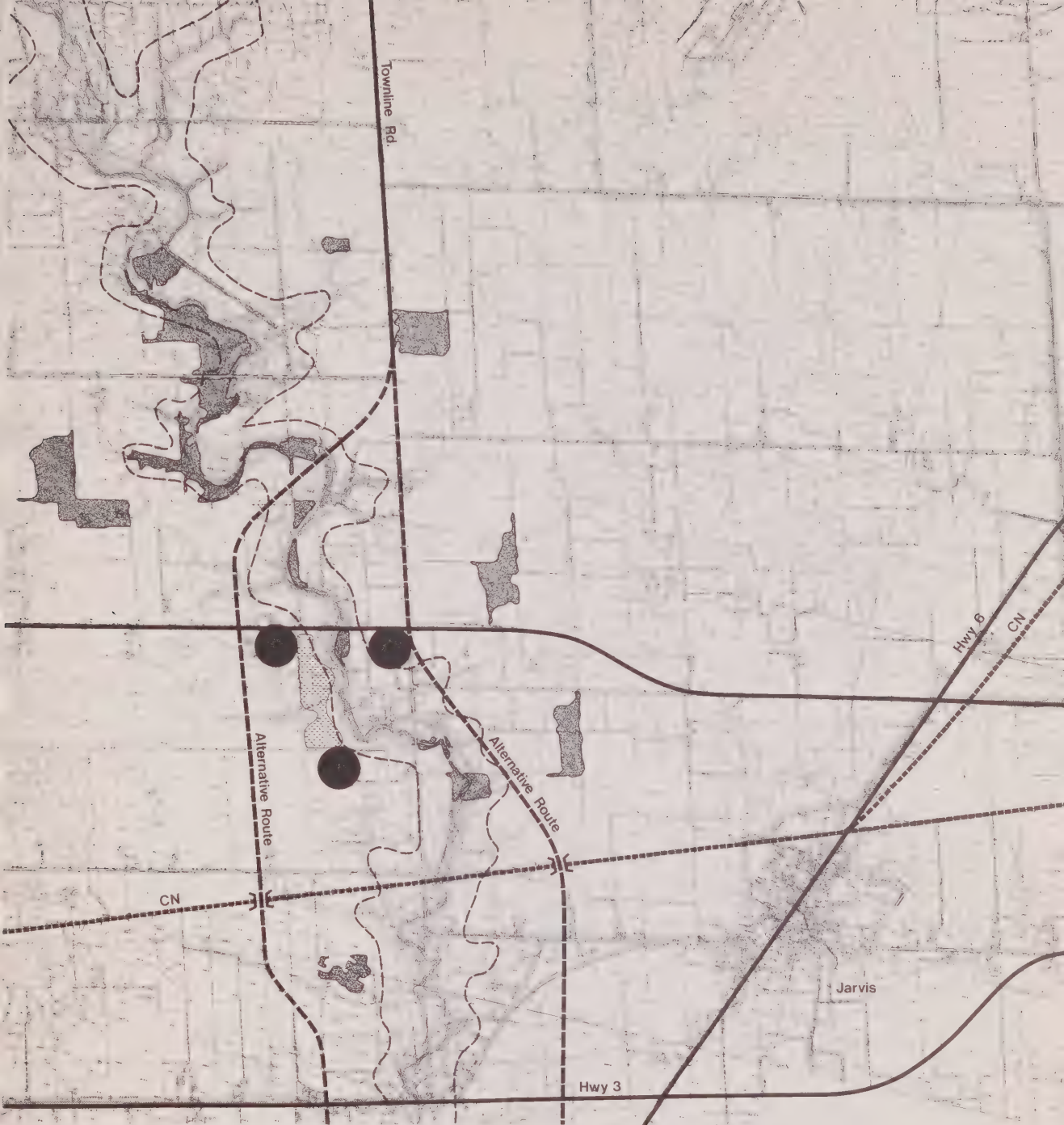
The Region requires about 2,700 m<sup>2</sup> of gross floor space to accommodate its present staff. As a first estimate, this will require a site of 2½ ha.

The office facilities should be located in Townsend as a means of establishing its regional role and image. The question is where, bearing in mind that new facilities are needed as soon as possible, and probably in advance of any decision about the location and layout of the regional centre.

Several locations could be provided for the regional offices for construction in the immediate future. (See figure 4.13.) They are next to the Nanticoke Creek, a realigned Townline Road, and within the development envelope for the first community of 20,000. These options are in the middle of the new town, potentially next to a realigned Highway 3 or similar capacity east-west road, and a small lake created out of the quarry pits.

These locations also are adjacent to the potential site being explored for the regional centre.

The regional offices would be located in an area to be designated as an office campus. The campus would be in a highly attractive area next to a linear town park along the Nanticoke, and highly accessible from regional roads.



# Potential Locations for Regional Administrative Centre

- Potential Location
- Major Routes for Townline Rd.
- ▨ Existing Woodlots
- Flood Plain
- ▧ Fill Line
- ▤ Pond



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## CONCLUSIONS AND RECOMMENDATIONS

### 5:00 DEVELOPMENT ENVELOPES

One of the main objectives of the Phase I program was to determine those areas likely to be required for development. This was necessary so that the farming operations in the area could be planned, and farmers most likely to be affected notified. From the planning viewpoint, the determination was helpful because the ongoing planning work could be focused more effectively on a smaller area of the site.

Two development envelopes have been recommended. (See figures 5.30 and 5.40.) The smaller contains the area needed for the first community of 20,000 population, which will be developed at the earliest by 1986. The larger is for the ultimate community of 100,000, which will be developed well after 2000.

Both areas are larger than will be finally required for development. Further studies must be completed in Phase II to determine which of the extra areas can be removed from further consideration.

The following section briefly documents the selection procedure, and then describes the envelopes in more detail.

#### 5.10 Selection Criteria

In order to select the development envelopes, various potential development parcels on the site were defined using major man-made or natural features like the railway and stream courses.

(See figure 5.10.) Each of the parcels, which contained broadly homogeneous areas of land, were evaluated using a number of criteria incorporating the following factors:

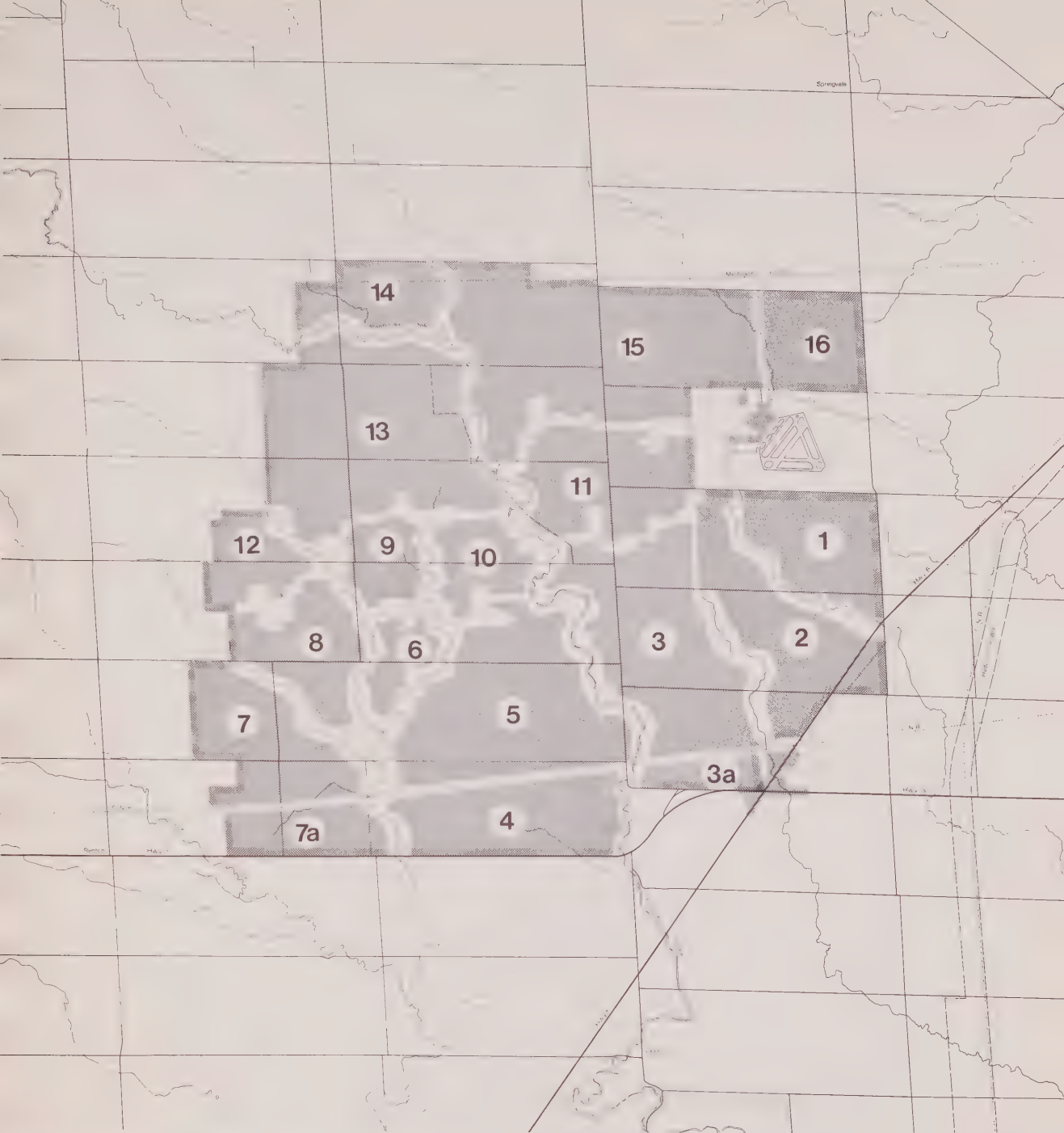
- 1) The major constraints for development, as caused by important biotic, abiotic and cultural/historical features and/or existing development. (See sections 3.10 and 3.20.)
- 2) The priority areas for agriculture and other agricultural considerations. (See section 3.30.)
- 3) The major holdouts from public ownership.
- 4) A number of planning considerations, such as accessibility to regional roads and major developments like the Nanticoke industrial area, proximity to regional services, and the impact on on-site development or on resources.

The major advantages and disadvantages of each parcel have been summarized under the various evaluation criteria. (See table 5.10.) For purposes of a brief overall review of the evaluation, the site can be divided into five broad zones.


The northwest corner of the site (parcels 9, 10, 12, 13 and 14) is a prime agricultural area, remote from regional roads and services, and the Nanticoke industrial area. While it contains no substantial development constraints, other than the possible bedrock sinks, it also would appear to offer no advantages for urban development not available elsewhere on the site that justify taking it out of agricultural production.

The northeast corner of the site (parcels 11, 15 and 16) contains a large number of problems: heavy clays, poor drainage, shallow overburden, close proximity to Livingstons, unattractive landscape, unacquired property and relative remoteness from early services, particularly sanitary drainage.

Development in the southeast corner of the site (parcels 1, 2 and 3) also would be affected by many construction difficulties: gas leaks,



## Development Parcels

 Parcels of Land Evaluated for Urban Development



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Table 5.10:  
Summary Evaluation of Alternative Development Areas

Evaluation Criteria	Development Parcels															
	1	2	3-3a	4	5	6	7-7a	8	9	10	11	12	13	14	15	16
ACCESSIBILITY TO REGIONAL FACILITIES																
Highway 6	++	++														
Highway 3		++	++	++	++		++									
Nanticoke industrial area	++	++	++	++	++											
Simcoe				+	+		+									
PROXIMITY TO MAJOR SERVICES																
Interim sanitary drainage			+++	+++	+++											
Regional sanitary drainage		++	++	++	++	++	++									
Regional water supply	+	+	+	+	+	+	+	+	+	+	+					
Public utilities	+	+	+	+	+											
CONSTRAINTS UPON URBAN DEVELOPMENT																
Shallow overburden		---									---					---
Gasfields		---														
Poor drainage and heavy soils	--	--	--								--				--	--
Bedrock sinks		---	---							---			---			---
IMPACT UPON AGRICULTURAL USES WITHIN THE SITE																
Priority areas in northwest section					---	---			---	---	---	---	---	---	---	---
Speciality crop area west of site							--	--				--	--			
General area south of site													-	-	-	-
IMPACT UPON NATURAL AND HISTORICAL RESOURCES																
Sandusk watershed	-	-	-													
Nanticoke valley			-		-					-	-		-			-
Black Creek ecosystem						-	-	-	-	-		-				
Sensitive woodlots			-		-		-	-				-	-	-	-	-
Archaeological remains											-		-		-	-
Gypsum bearing strata														-	-	-
Historic areas																
CONSIDERATIONS FOR PLANNING																
Noise exposure			--	--	--		--									
Visual attractiveness/potential marketability	--	--			++	++	++	++	++	++				--	--	--
Unacquired land				--			--				--	--	--	--	--	--
+ positive feature - negative feature +/- minor consideration ++/-- important consideration +++/--- critical consideration																



shallow overburden, possible bedrock sinks and heavy clay and poor drainage. The area within the flood and fill line of the Sandusk, which has not been plotted in this area, is likely to be considerable. Development here also could cause flooding in Jarvis.

The southwest corner (parcels 6, 7 and 8) is broken up by the flood and fill lines associated with the three tributaries of the Black Creek. The area contains a number of large woodlots sensitive to urban development, and is next to a highly productive market gardening area directly to the west of the site.

The remaining area (parcels 4 and 5) in the southern central part of the site has two main drawbacks: it is in part a good agricultural area, and is severed by the CN rail line. Because this area forms basically the core of the recommended envelopes, it is discussed in greater detail later. (See section 5.30.)

## 5.20 Land Requirements

A preliminary land-use budget for the community was prepared to guide the early conceptual planning, and to determine the area that might be required for development. (See Appendix C.) Comparative data from other Canadian new towns (see Appendix D) and the prior experience of the consultant team were used in preparing the budget, together with a first appreciation of the type of development that might be accommodated on the site. All of these figures will be examined further in the study in relation to the specific needs and conditions of Townsend.

The budget indicates that the land required in the development area, excluding major open space that could be in the valleylands or outside the urban area, is approximately the following:

- 1) 20,000 population: 400- 450 ha
- 2) 80,000 population: 1,700-1,800 ha
- 3) 100,000 population: 2,000-2,200 ha

If the development envelope for the first community of 20,000 is to incorporate also space for

the ultimate regional centre, the total area required might be in the order of 450-500 ha total.

The housing densities used in preparing this budget were kept intentionally, although not unrealistically, low. Land for housing takes roughly half of the development area, and a modest change in the densities can greatly affect the overall land requirement. The lower densities were used to ensure that the land allocated at this time would be sufficient for the largest reasonable requirement.

The resulting overall town densities are in the range of 46-47½ persons/ha (19-20 p/a); or 15-16 dwellings/ha (6-7 dw/a). These figures correspond fairly well with those for other Canadian new communities. (See Appendix D.) However, the amount of employment land allowed for within this figure is lower than typical. (See section 4.30.)

The net housing density in the initial Townsend estimates is 87-88 persons/ha (36-37 p/a), or 27½-29 dwellings/ha (11½-12 dw/a). Most of the corresponding net densities for the other Canadian new communities fall in the range of 29-32½ dwellings/ha (12-13½ dw/a), which indicate the degree of possible surplus and flexibility that has been included.

### 5.30 Initial Development Envelope

The recommended development envelope for the first phase of the community is located predominantly in the triangle of land between the Nanticoke Creek, the Black Creek tributaries, and the CN railway. (See figure 5.30.)

The development area is separated from the permanent and transitional farming areas by major open space buffers, following either the natural stream courses or the nearly continuous chain of east-west woodlots.

### 5.31 Potential Development Areas

The envelope covers about 770 ha of developable land outside the fill line. Of this, only

400-500 ha may be required eventually for 20,000 persons, if space also is allowed for the ultimate regional centre. The additional land has been retained in the potential envelope until more is known about a number of factors:

- 1) The location of the regional centre as well as the early administrative centre.
- 2) The characteristics of the initial housing.
- 3) The location of the interim stabilization ponds.
- 4) The realignment of the Townline Road.
- 5) Any construction problems in the area that might be found by the detailed geotechnical survey.

Within this overall envelope, the area required for 20,000 could be accommodated in three alternative places (see figure 5.31):

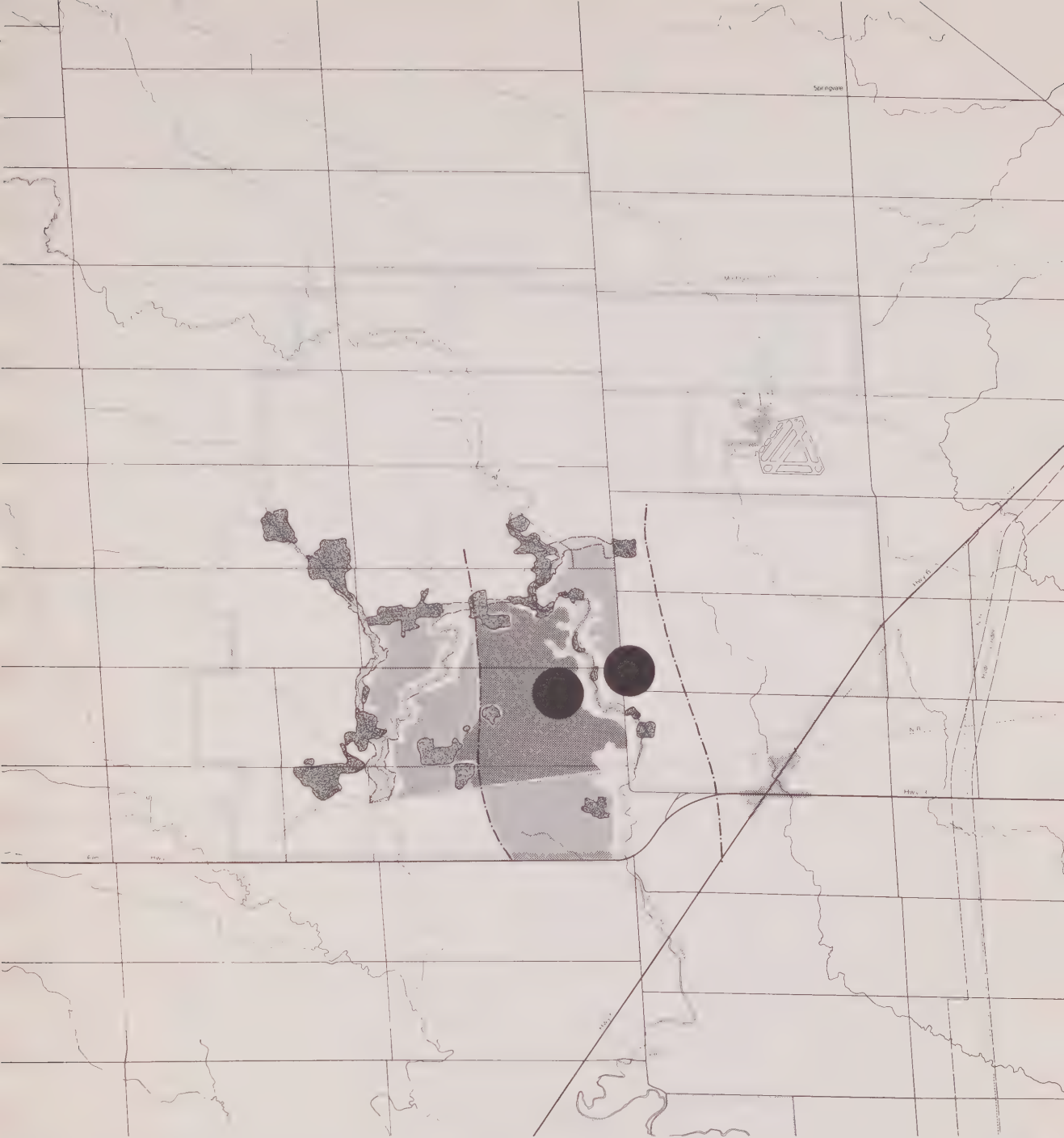
- OPTION A (405 ha) falls within the Nanticoke watershed.
- OPTION B (485 ha) is between the two stream courses.
- OPTION C (430 ha) is focused on the Black Creek area.

The area south of the CN railway could be needed for non-residential uses — namely, the regional centre, waste stabilization ponds and/or a new alignment of the Townline Road. Therefore, it could be linked with any one of the three options.

Alternative plans for the 20,000 community will be prepared also for each of these areas in Phase II before final selection.

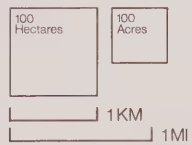
### 5.32 User Input

Group discussions were held with a number of Stelco employees representative of those who might move to Townsend, and with a number of recent movers to the general area. Among other issues, they were asked to review possible initial alternative development areas within Townsend.



# Recommended Development Envelope Phase 1: 20000 Population (1986)

- Confirmed Areas for Development
- Possible Areas Requiring Study
- Possible Locations for Regional Centre
- Flood Plain with Fill Line
- Woodlots
- Watershed Boundary

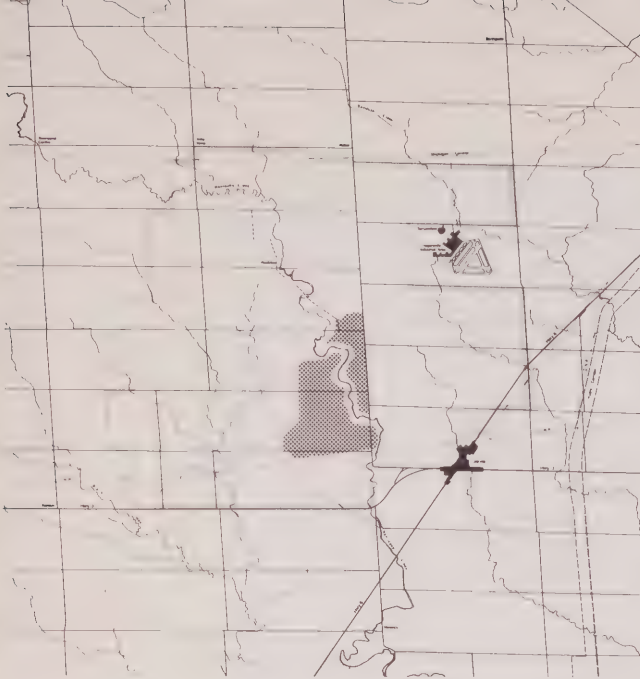


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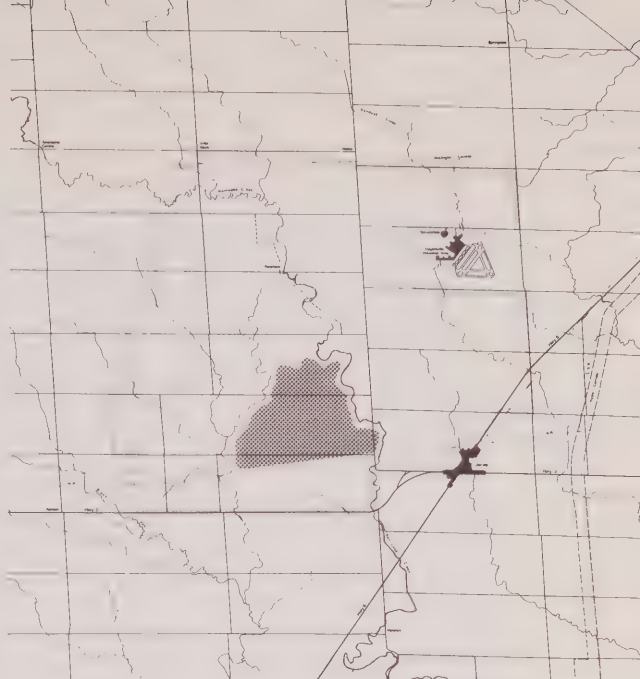
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Option A



Option B



Option C

**Alternative Development Areas:**  
20000 Population

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In general, having a visually attractive site was above all the most important consideration. Of some importance for some also was having convenient access in the early years to a full range of facilities in a local centre like Simcoe; and for others, especially the young, easy access to major centres like Hamilton. Only of relative importance was having a quiet and pollution-free environment — which generally meant not being within sight of a railway and highway. Quick access to Nanticoke was not an important consideration; all of Townsend was well within acceptable commuter distance.

### 5.33 Main Reasons for Selection

The recommended development envelope for 20,000 is located near the main east-west regional route, Highway 3, and near the main route into the Stelco site, along Townline Road.

The envelope is predominantly within the watershed of the Nanticoke Creek, which is the only watercourse that can be used for the interim sanitary drainage system. It also can be readily served by the proposed regional systems for water supply and sanitary drainage, and by the existing systems for gas, hydro and telephone.

The area contains some of the most attractive parts of the site, which will be important for marketing the first housing.

The area can expand in a number of directions to accommodate the full 100,000, and therefore, can respond to additional information about the housing market, regional centre, and environmental and agricultural concerns. At the same time, if development was to be curtailed within the next few years, the development in this area could be attractive, well-defined and economical.

The site can accommodate the three alternative locations for the regional centre. (See section 4.10.) These allow considerable flexibility, not only in the location of the centre, but also in the timing and functional relationship to the residential areas.

The envelope stays away from the major development problems on the site, except for some areas of heavy clay which are spread throughout the

area. The location allows time to develop a planning policy about the growth of Jarvis and its relation to Townsend.

Finally, although the area does not rank high on all of the user criteria, it does rank high overall.

#### 5.34 Main Drawbacks of Location

The major disadvantage of the recommended envelope is that the development will take good farmland out of production. Bearing in mind the generally good quality of the entire site, and that good farmland is generally good development land, this consequence is probably inevitable.

Despite the loss of good land and some productive farms, the location still reflects important agricultural concerns by concentrating development in an area that can be buffered from the largest area of prime agricultural land by natural open space systems, and by locating the development as close as possible to the Nanticoke industrial area.

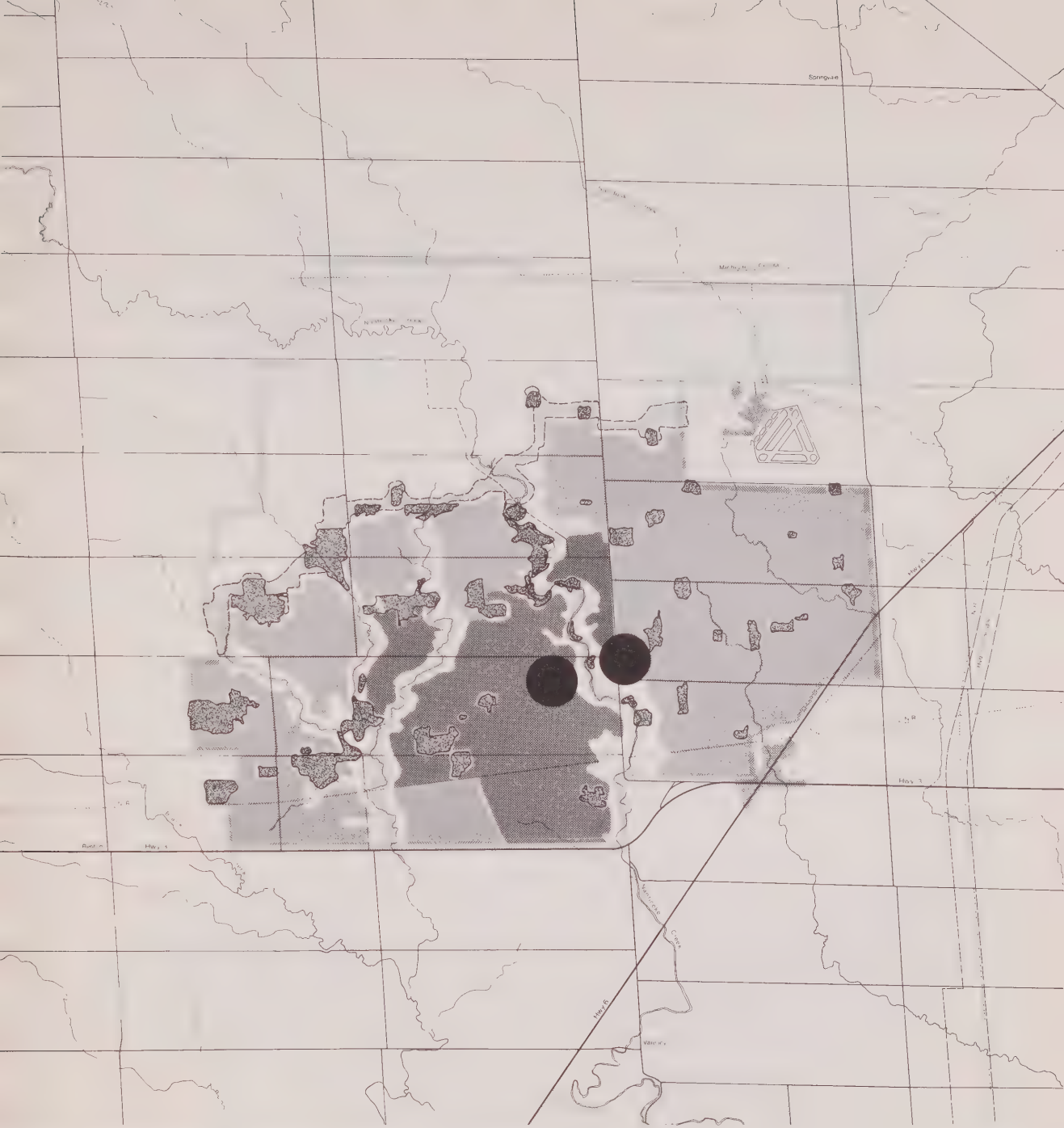
Other disadvantages are that the CN rail line traversing the southern edge of the area generates unwanted noise; and the envelope is not near Highway 6, which is the major north-south road in the Region.

#### 5.40 Ultimate Development Envelope

The recommended development envelope for 100,000 population covers some 2,700 ha. Of this, 2,100-2,300 ha may be required ultimately. Although actually covering less than half of the site, the envelope covers broadly the lower two-thirds of the Townsend site, because of the associated but undevelopable valleylands. (See figure 5.40.) The potential development area is defined, and separated from the permanent agricultural area across the northern part of the site, by an open space buffer incorporating valleylands and major woodlots.

#### 5.41 Potential Development Areas




Within this total envelope, there are a number of possible development areas (see figure 5.41):

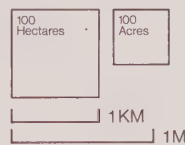


## Recommended Development Envelope Final Phase: 100 000 Population (Post 2001)

-  Confirmed Areas for Development
-  Possible Areas Requiring Further Study

-  Possible Locations for Regional Centre

-  Flood Plain with Fill Line
-  Woodlots
-  Watershed Boundary

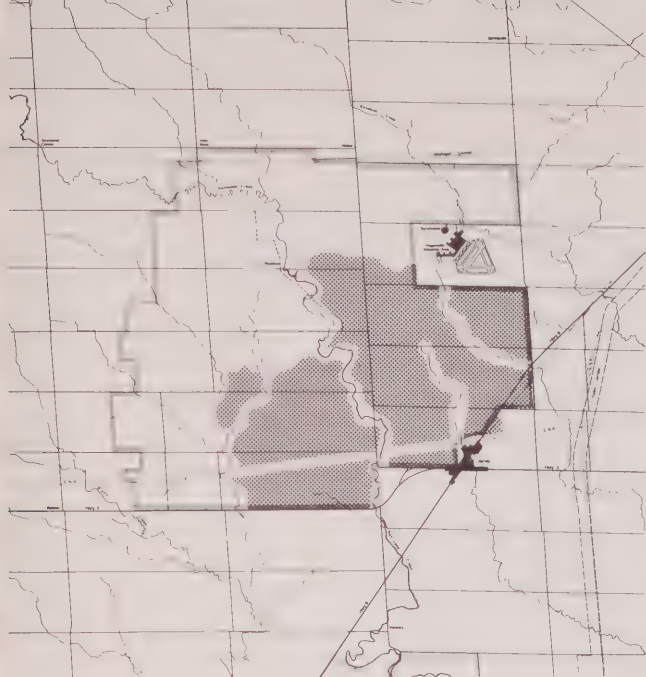


Date April 76

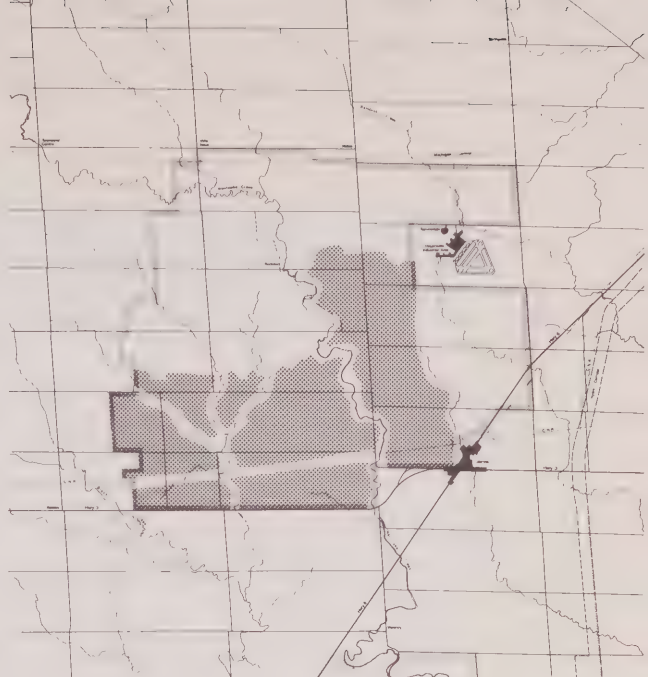
**TOWNSEND**  
COMMUNITY DEVELOPMENT PROGRAM



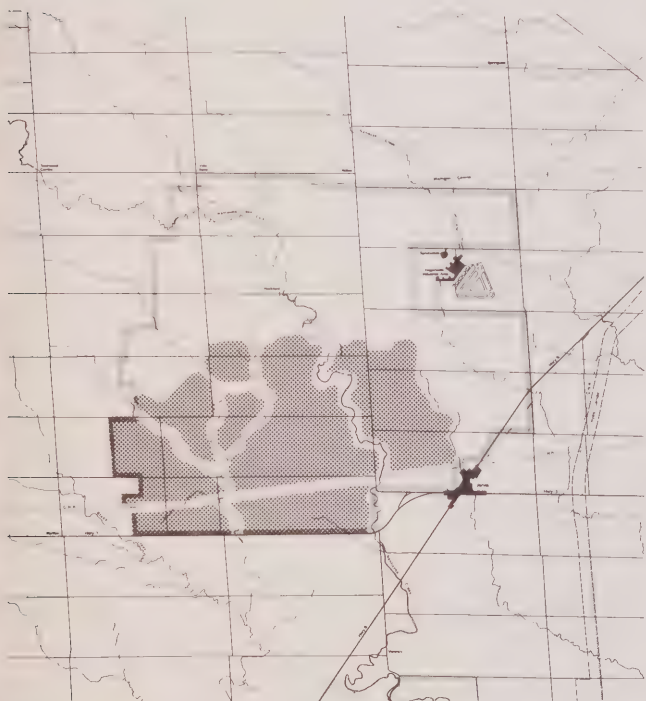




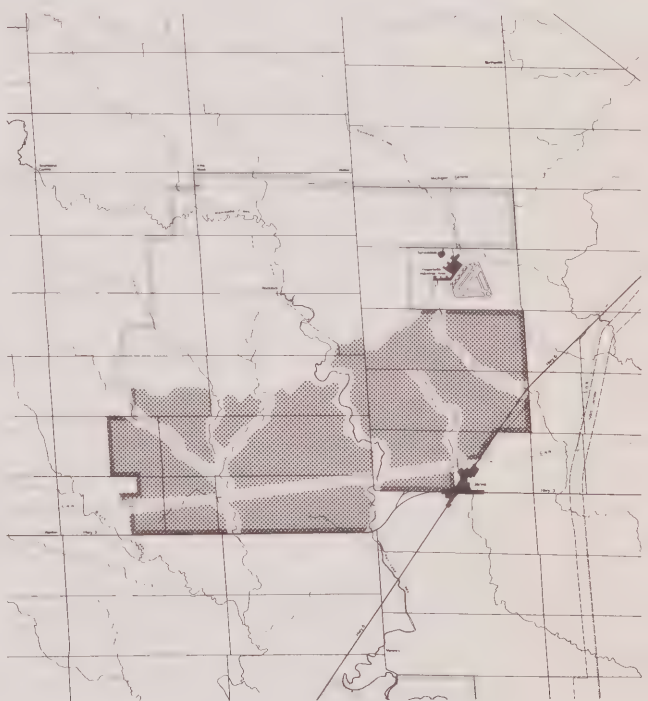
Option A



Option B



Option C



Option D

**Alternative Development Areas:**  
100 000 Population

**TOWNSEND**  
COMMUNITY DEVELOPMENT PROGRAM



- OPTION A (2,200 ha) concentrates in the eastern and southeastern areas of the site, and thereby stays out of the Black Creek area and good agricultural land near Rockford.
- OPTION B (2,100 ha) is located to the west of the Sandusk; it excludes the potentially difficult development area above Jarvis, but includes the Black Creek tributary area.
- OPTION C (2,000 ha) maintains the bulk of development to the west of the Nanticoke Creek; in so doing it takes land close to Rockford, but remains clear of Jarvis and the development problems to the north.
- OPTION D (2,300 ha) extends across the southern part of the site, leaving a large contiguous area for agriculture across the northern half, but develops both above Jarvis and in the Black Creek area.

All of these options also are defined by alternative open space buffers.

The final selection of one or a combination of these development areas will depend upon a more detailed evaluation of, and probably a trade-off between, these major factors:

- 1) The storm drainage problems and potential construction difficulties in the area above Jarvis.
- 2) The long-term agricultural potential of the various areas around Rockford.
- 3) The recreation and agricultural potential of the Black Creek tributary area.
- 4) The development constraints imposed within the fill line.

Also, of some importance to the final selection will be the relationship of Jarvis to Townsend, the impact of the CN rail line, and the location of the regional centre.

#### 5.42 Main Reasons for Selection

The northwestern part of the site is the best area to retain for permanent farm use, considering both the existing capabilities of the

farms and the area's relationship to the wider agricultural interests. The recommended envelope retains this area in permanent agricultural use, and furthermore, provides a means for buffering it from urban encroachment.

From an urban planning viewpoint, the recommended envelope is also well-located, considering the location of the Nanticoke industrial area and the existing or proposed regional infrastructure. Starting with the initial development area for 20,000, the envelope has the flexibility to be developed in a variety of ways. It also incorporates the main stream courses and other most attractive parts of the site, which can be used as major natural amenities in the development.



APPENDIX A:  
Outlined Work Program for Phase I through III

Phase I: January-March 1976

- Assemble and review the existing background material.
- Clarify principal policy issues concerning role, size and timing of Townsend.
- Prepare an inventory of the main environmental and agricultural resources of the area.
- Prepare initial design concepts in order to illustrate main physical planning options for discussion and review.
- Select the development envelopes for the total community of 100,000 and for the first community of 20,000.
- Prepare a progress report.

Phase II: April-September 1976

- Prepare alternative plans for the first community of 20,000 and for the total community of 100,000.
- Complete the various specialized studies necessary for preparing the plans, such as analysis of the potential population and employment profiles; housing market; the requisite shopping, education and other facilities; private and public transit; and engineering services and public utilities.
- Prepare planning policies for the permanent and transitional agricultural areas of the site.
- Specify the area to be planned for the first neighbourhood area and initial regional facilities.
- Determine the location of the regional centre.
- Delimit further the general development envelopes selected in Phase I.
- Prepare the final recommended plan for the first community of 20,000 (scale 1:10,000), and the recommended plan for the total community of 100,000 (scale 1:25,000).
- Prepare an interim report describing the proposals.

### Phase III: October 1976-March 1977

- Examine in greater detail various parts of the plan, for example, the regional centre, important environmental areas, road profiles, prototypical housing areas and/or local centres.
- Develop a phasing program for the plan.
- Prepare a subdivision plan for the first neighbourhood of 5,000 persons approximately and initial regional facilities.
- Prepare management and implementation recommendations for various aspects of the plan, such as the storm water system, public transit, housing program and shopping development.
- Prepare an initial financial assessment of the proposals.
- Prepare a statement of the environmental impact of the plan.
- Prepare a final report reviewing the planning proposals and management recommendations.

APPENDIX B:  
Detailed Work Program for Phase IIa

Transportation and Services Coordination Area

- initiate and coordinate detailed geotechnic survey of building constraints within the development envelope.
- model main regional traffic movements through/in and out of the site, particularly to the Nanticoke industrial area.
- develop alternative private and public transport systems in conjunction with alternative community structures and first community plans.
- identify the various service and utility systems that will affect the plans, and prepare development guidelines for use in preparing the alternatives.
- review the feasibility of "innovative" servicing and utilities systems — particularly district heating.
- determine the impact on Jarvis of development in the Sandusk watershed, and the preliminary requirements for storm water control.
- determine a new alignment for Regional Road 27 through the site to Stelco, and study as necessary other detailed aspects of the road system.

Economic and Social Coordination Area

- develop population profiles and characteristics for the first community and entire town.
- complete a housing marketing study, and specify the physical requirements for housing for the first community and entire town.
- determine physical requirements and organization of the school system, including separate schools.
- determine main regional facilities to be located in the town, and particularly the centre.
- undertake second user survey, to aid in evaluating the initial concepts and alternative community structures.

### Environmental and Agricultural Coordination Area

- develop in greater detail the critical development constraints for the first community, including specifically the fill line; plot at 1:10,000.
- analyze those particularly unique and/or vulnerable features identified in Phase I that will be affected by development, and develop proposals for protecting and enhancing them.
- prepare broad policies for the transitional and permanent agricultural areas.

### Physical Design Coordination Area

- develop alternative community structure models, incorporating the different possible spatial patterns for the main facilities and services (i.e. shops, schools, health) in conjunction with alternative housing patterns and transport networks for cars, buses and pedestrians.
- set up and coordinate detailed surveying and mapping of the terrain and trees.
- evaluate preliminary design concepts developed in Phase I.
- prepare alternative plans for entire town of 100,000 for post-2001 (scale of 1:25,000).
- prepare alternative plans for first community area of 20,000 for 1986 (scale of 1:10,000).
- develop schematic layouts for regional centre to examine alternative locations, land requirements and growth processes.
- determine location of first neighbourhood for 5,000 persons approximately, plus associated support facilities and the initial regional requirements.
- determine the location of the regional administrative centre if required.
- delimit further the development envelopes for the entire town and first community.

## APPENDIX C: Preliminary Land-Use Budget for Townsend

Land-Use	1986: 20,000 Population	2001: 80,000 Population	Post-2001: 100,000 Population
<u>Neighbourhood Area</u>			
Low density housing* (60% at 22½ dw/ha)	214	857	1,071
Medium density housing* (20% at 35 dw/ha)	36	152	190
High density housing* (20% at 75 dw/ha)	17	71	89
Open space and pedestrian system (1.6 ha/1,000 population)	32	128	160
Elementary schools (0.6 ha/1,000 population)	12	48	60
Corner shops (1 at 0.3 ha/7,500 population)	1	4	5
Social facilities (1 at 0.1 ha/7,500 population)			
Local roads** (2.0 ha/1,000 population)	( 40)	( 160)	( 200)
	312	1,260	1,575
<u>Regional Centre</u>			
Shopping facilities	-	12	15
Offices	-	4	5
Civic and cultural facilities	2	10	13
Government offices	½	2	3
	2½	28	36
<u>Major Facilities</u>			
Supermarket and associated facilities (0.1 ha/1,000)	2	10	12
Offices	½	2	3
High schools (0.4 ha/1,000)	8	32	40
Open space and recreation facilities (0.4 ha/1,000)	8	32	40
Social facilities (0.4 ha/1,000)	8	32	40
	26½	108	135
<u>Employment Areas</u>			
Manufacturing and warehousing areas	10	100	125
Office campuses	1	4	5
	11	104	130
<u>Open Space</u>			
Golf courses (1 at 60 ha/50,000 population)	60	120	120
Town park (0.4 ha/1,000) and general landscaping	8	32	40
	68	152	160
<u>Transportation and Utility Corridors (2.0 ha/1,000)</u>	40	160	200
<u>Other Facilities</u>			
Community college	-	20	25
Regional hospital	2	8	10
Sports complex	-	10	13
Highway commercial	2	8	10
Reserve sites	20	20	20
<b>TOTAL</b>	<b>484</b>	<b>1,878</b>	<b>2,314</b>

### Notes:

- \* based upon the following assumptions:  
 3.2 per dw in 1986; and 3.0 per dw in 2001 and after  
 low density = 30% singles, 20% semis and 10% on-street town  
                   houses = 17½ dw/ha net (7 dw/a)  
 medium density = en bloc townhouses, quads, etc.  
                       = 35 dw/ha net (14 dw/a)  
 high density = apartments or stacked multiples  
                   = 75 dw/ha net (30 dw/a)

- \*\* these areas for local roads are contained already in the above  
 net housing figures; and therefore, are not added to the total





APPENDIX D:  
Comparative Land Budgets for Canadian New Towns

New Communities	Densities							Housing Types (%)			Area-Population Rates (acres/1,000 population)						
	Final Population	Development Area (acres)	Dwelling Units	Average Dwelling Size (per/dw)	Gross (per/a)	Net (per/a)	Net (dw/a)	Singles + Town + Terraced	Apartment	Housing	Industry	Commercial	Parks + O.S.	Institution	Other	Total	
Don Mills <sup>1</sup>	27,980	2,063	8,121	3.45	13.6	35.3	10.2	44½	16	39½	28.4	11.1	2.2	13.5	-	13.5	73.7
Bramalea <sup>1*</sup>	165,500	8,194	31,203	5.30	22.0	48.0	9.0	32	42	26	20.8	13.0	1.4	6.6	-	7.7	49.5
Erin Mills <sup>2</sup>	170,000	8,730	49,600	3.43	19.5	45.0	13.1	40	23	37	22.2	5.6	2.4	5.6	4.9	10.7	51.4
Meadowdale <sup>3</sup>	75,000	2,915	21,623	3.47	30.9	79.8	23.0	12	**	**	12.5	4.9	1.1	5.0	-	8.9	32.4
Meadowdale <sup>3</sup>	70,000	2,430	19,460	3.60	28.8	60.8	16.9	19	46	35	16.4	5.3	1.1	5.3	2.6	3.8	34.7
Malvern <sup>4</sup>	35,000	1,700	11,423	3.06	20.6	42.0	13.7	50	30	20	23.8	5.1	1.8	4.3	5.7	8.5	48.7
Mill Woods <sup>5</sup>	120,000	5,560	33,800	3.55	21.6	45.2	12.7	33	26	41	22.1	0.0	1.8	1.9	2.9	11.5	46.3
Nun's Island <sup>6</sup>	50,000	970	15,000	3.33	51.5	125	37.5	-	-	-	8	4.4		4	3	0.1	19.5
Saltfleet <sup>7</sup>	70,000	3,670	19,400	3.62		36.9	10.2	45	34	21	27.2	0.0	0.5	10			36.9
Kanata <sup>8***</sup>	64,500	2,615	17,614	3.66	24.7	46.3	12.6	26	33	41	21.6	6.0	-	6.0	-	6.9	40.5
North Pickering <sup>9</sup>	75,000	6,800	23,185	3.23	11.03	42.1	13.0	35	40	25	23.7	14.8	2.7	29.7	5.3	14.5	90.7
Townsend	100,000	-	33,330	3.00	-	35.2	11.7	30	50	20	28.4	3.2	1.2	9.2	4.7	10.5	57.2

Sources:

- 1 Bureau of Municipal Research: "The Toronto Region's Privately Developed New Communities", 1972.  
2 Erin Mills Master Plan.  
3 Meadowvale Master Plan.  
4 Malvern Development Plan and Programme.  
5 Mill Woods Plan, 1971.  
7 Final Report: Saltfleet Community Development, October 1969.  
8 "Kanata" (Publicity Brochure).  
9 Recommended Plan: North Pickering Project (1975).

Notes:

- \* Final population has been reduced to 125,000 by TCR, and housing mix has changed.  
\*\* 19½% in townhouses only, and 68½% in terraces and apartments.  
\*\*\* All figures exclude existing population and development.



APPENDIX E:  
Background Technical Papers

Economic and Social Coordination Area

Population, Employment and Households (1976-2001): for the Regional Municipality of Haldimand-Norfolk (February 1976)

The Role and Function of the Regional Centre in Townsend (February 1976)

A Preliminary Perspective on Employment and Population in Townsend (February 1976)

A Group Discussion Study: A Move to Townsend (March 1976)

Environmental and Agricultural Coordination Area

An Overview Analysis of the Environmental and Agricultural Features of the Townsend Site (April 1976)

Transportation and Services Coordination Area

Regional Transportation Infrastructure (February 1976)

Local Transportation Inventory (March 1976)

Regional Services Infrastructure (March 1976)

Physical Design Coordination Area

The Development Schedule from Subdivision Plan Submission to First House Completion (February 1976)

A Review of the Phase I Planning Work (April 1976)

The Selection Process of the Recommended Development Envelopes (April 1976)







